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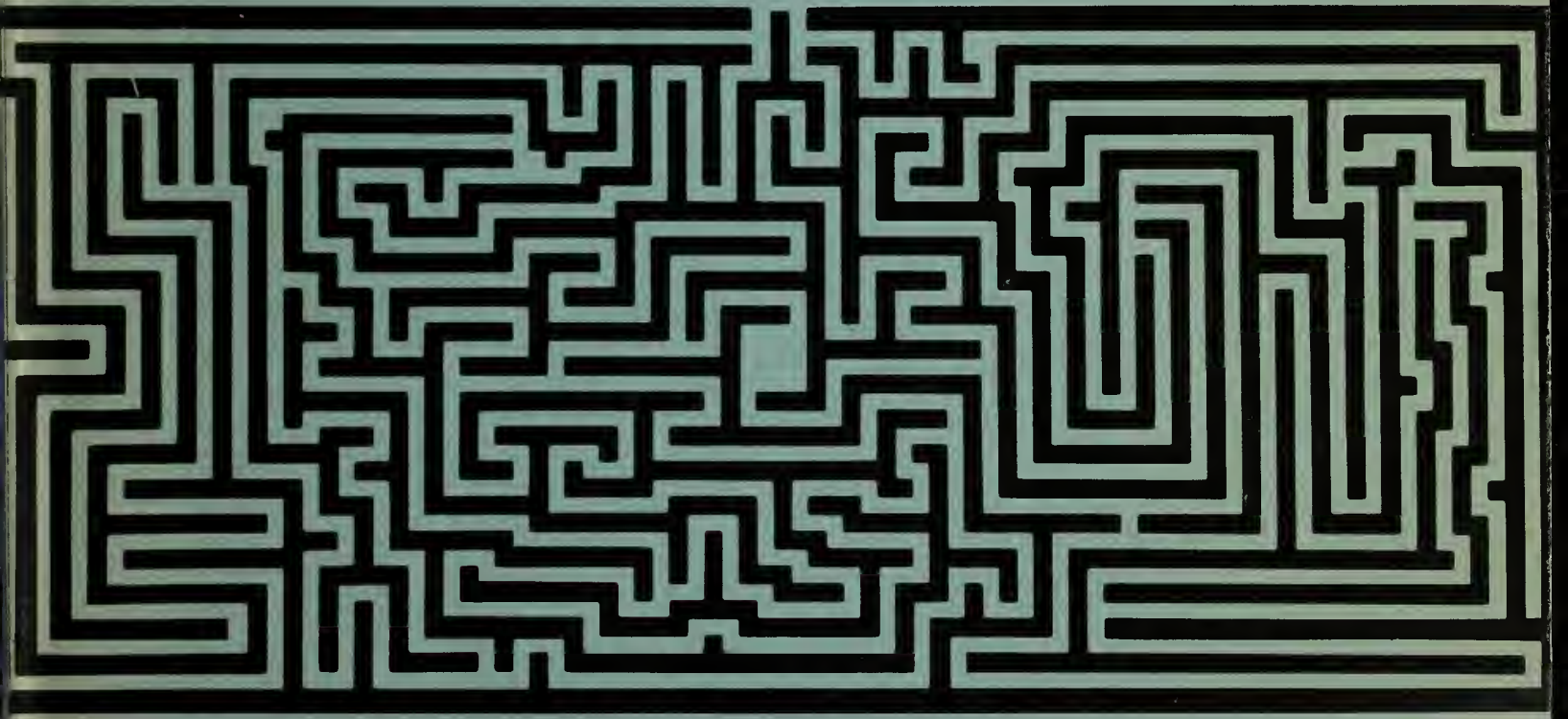
PSRO:
An Initial Evaluation of the Professional Standards Review Organization

VOLUME 1:
EXECUTIVE SUMMARY



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VOLUME I

PROFESSIONAL STANDARDS REVIEW ORGANIZATIONS: PROGRAM EVALUATION

EXECUTIVE SUMMARY

PSRO: AN INITIAL EVALUATION OF PROFESSIONAL STANDARDS REVIEW ORGANIZATIONS

February 1978

Report Number: OPEL 77-12

Office of Planning, Evaluation and Legislation
Health Services Administration

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PREFACE

This volume is a part of the evaluation of the Professional Standards Review Organization (PSRO) program as conducted during fiscal year 1976 and 1977 by the Office of Planning, Evaluation and Legislation (OPEL) of the Health Services Administration, U.S. Public Health Service, Department of Health, Education, and Welfare. The emphases of the evaluation were (1) utilization control, quality assurance, and cost-containment impacts and (2) program costs. The evaluation was conducted at a time when the PSRO program was in an early stage of implementation. It indicates what impact the PSRO program had achieved by the start of 1977, provides baseline data for future evaluative work, and offers pilot tests of numerous quality assurance and utilization control evaluation methodologies. Summarized below are the evaluation's major findings.

One major empirical study conducted was an analysis of Medicare utilization data compiled expressly for this evaluation by the Social Security Administration. The Medicare analysis investigated the effects of the PSRO program on hospital days of care per 1,000 enrollees, hospital admissions per 1,000 enrollees and average length of stay. Eighteen active PSRO areas were compared to twenty-six matched nonactive PSRO areas. No aggregate PSRO effect was found on the utilization variables studied. This finding implies that as a "treatment" the PSRO program thus far has not differentially affected Medicare utilization, when compared to other forms of utilization review being conducted in non-PSRO areas. While no overall relative utilization decrease was found, individual experiences varied. Some of the organizations were associated with lower (favorable) utilization while others reflected higher (unfavorable) utilization relative to their matched comparison areas. Generalizations from this data to the future program which will cover the entire U.S. would be tenuous, due to the unavailability of a proper random sample of the total 203 designated PSRO areas.

An analysis of hospital discharge abstract data, primarily derived from the Commission on Professional and Hospital Activities' (CPHA) Professional Activity Study (PAS) system found a very small relative decrease of less than 0.1 day in overall case mix-adjusted length of stay for Federal patients in PSRO hospitals using this abstracting service. When the patient records were sorted by payment sources, there were small, but statistically significant, findings with respect to Medicare and Medicaid average length of stay. Smaller (unfavorable) decreases in case mix-adjusted length of stay were found for Medicaid patients in hospitals under PSRO review than in non-PSRO comparison hospitals. In contrast, greater (favorable) decreases in ALOS were found for Medicare patients. It was also found that, in some instances, the proportion of longer stays in PSRO hospitals experienced a relative decline. The analysis also indicates greater reductions in average length of stay in PSRO areas with higher supplies of long-term care beds.

In contrast to the utilization findings presented above the effectiveness of the PSRO program as a quality assurance mechanism was less directly

measurable. The hospital discharge abstract data did indicate, however, that PSRO review tends to be associated with increases in case mix severity for Medicaid patients, but not for Medicare patients. This severity finding, while tentative because of methodological reasons, does suggest that PSROs may be utilizing bed days more efficiently.

Quality-oriented components of the PSRO program are just now being implemented. A study of a sample of medical care evaluation studies (MCEs) indicates that these studies have been effective in identifying and correcting problems of medical care in hospitals. The number of initial audits reported has grown to over a thousand per quarter, but the number of reaudits reported is small.

Profile analyses are implemented in only a few PSROs.

With respect to program costs, several policy options were considered, all computed in 1976 dollars. Targeted review1/ is the policy option currently (1978) in force in the PSRO program. The cost of targeted review, assuming review of 20% of all Federal patient hospital stays for 1976, was estimated at $184 million. 2/ In contrast, a fully implemented acute care PSRO program to review 100% of Federal patient hospital stays would have cost approximately $268.5 million in 1976. The associated Federal discharge unit costs, including costs attributed to donated physician time, are calculated at $18.31 for delegated PSRO review and $16.00 for nondelegated PSRO review. 3/

The PSRO program is more expensive than its utilization review predecessors. The cost of nationwide implementation of the original utilization review (UR) regulations was estimated at $81.3 million for 1976, while nationwide implementation of the 1974 revised draft UR regulations in 1976 would have cost about $107.6 million.

In order to "recover" its costs, a 100% concurrent review PSRO program would have to reduce utilization rates of covered populations by 1.6 to 2.05 percent. For a 20% targeted review program, corresponding figures would be 1.1 to 1.4%. Study findings imply that, even though a few PSROs have demonstrated this degree of cost-effectiveness, the PSRO program is not now cost-effective and thus is not yet serving as a cost-containment mechanism.

1/ i.e., review of less than 100% of discharges.

2/ The 20 percent figure was an arbitrary choice for purposes of illustration, and does not necessarily reflect an appropriate level of targeted review for the PSRO program.

3/ These figures are not strictly comparable in that nondelegated review includes only concurrent review, MCE, and abstracting costs, while delegated review also includes the costs of hospital UR committees and those hospital general administration costs which are allocatable to PSRO review.

The report cautions the reader against reaching final conclusions about the program since the evaluation was conducted during the time the program was in the developmental stage. However, the data suggest that PSRO implementation alone, without other changes to the health care system, is not apt to cause significant changes in either hospital utilization rates or associated governmental expenditures. The potential of the PSRO program to effectively assure the appropriateness and quality of care rendered in hospitals could not be adequately assessed within the time-frame of this evaluation. Therefore, more study is urged in several important areas as program development and implementation is continued. Many issues have been identified in the course of the evaluation which should be of value in deciding on the direction of future work.

ACKNOWLEDGEMENTS

The staff of the Office of Planning, Evaluation and Legislation (OPEL) would like to acknowledge the cooperation and assistance of many persons, without whose aid this evaluation would not have been possible.

The design of the evaluation was guided by a DHEW departmental advisory group. These individuals represented the Office of the Assistant Secretary for Planning and Evaluation, the Office of the Assistant Secretary for Health, the Office of the Assistant Secretary, Comptroller, and Health Care Financing Administration, and the Office of Management and Budget. In addition, the members of the National Professional Standards Review Council provided assistance by reviewing the evaluation design.

The various utilization, cost and quality field studies were made possible by the assistance and cooperation of representatives of the DHEW regional offices, local PSROs, Medicare fiscal intermediaries, the Medicaid State agencies, individual hospitals, local hospital associations, local medical societies, and Health Systems Agencies. A great amount of data and technical support was provided by the Health Care Financing Administration.

Many of the studies were performed by contractors under the supervision of OPEL contract officers. These contractors were: Arthur Young & Company, Inc.; Macro Systems, Inc.; General Research Corporation; The Orkand Corporation; Applied Research Systems, Inc.; Commission on Professional and Hospital Activities; Kappa Systems, Inc.; the Mississippi State Medical Association; the Mississippi Foundation for Medical Care, Inc.; SysteMetrics, Inc.; Lawrence O. Bodin, Ph.D.; Thomas Buntyn; C.M. Dayton, Ph.D.; Peter McMenamin, Ph.D.; Bonnie L. Owen; Robert Pfaffenberger, Ph.D.; Franklin E. Robeson, Ph.D.; and Jane M. Walsh.

The evaluation was aided by a Technical Advisory Panel composed of individuals of recognized expertise in the area of health care evaluation. The panel members were as follows:

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PSRO EVALUATION REPORT VOLUME STRUCTURE

Volume 1 : Executive Summary

Volume 2 : A Context for PSRO Evaluation: The Program and Evaluation Precedents

Volume 3 : Acute Care Utilization Review Impact: Some Data on the Medicare Experience

Volume 4 : Acute Care Utilization Review Impact: Inferences from a Sample of Hospital Abstract Data

Volume 5 : A Comprehensive Case Study: The Colorado PSRO Experience

Volume 6 : Case Studies of PSROs: A Contextual Analysis

Volume 7 : PSRO Quality Impacts: Inferences from the Medical Care Evaluations

Volume 8 : The Costs of Utilization Review Programs in Hospitals and in PSROs

Volume 9 : Acute Care Utilization Review Costs Associated with the Medicare/Medicaid Programs

Volume 10: Acute Care Utilization Review Costs: Synthesis of Components and Estimates for a Fully-Implemented Program

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1. INTRODUCTION AND SUMMARY

1.1 Background

Purpose of This Document: This document summarizes the F.Y. 1976 and 1977 Department of Health, Education, and Welfare (DHEW) evaluation of the Professional Standards Review Organization (PSRO) program. The evaluation was conducted by the Office of Planning, Evaluation and Legislation, Health Services Administration (OPEL/HSA) under the general guidance of an advisory group assigned by the Office of the Secretary, DHEW. This volume is intended to serve as an analytical resource for DHEW staff, the National Professional Standards Review Council for use in preparing their annual report to the Congress and the Secretary, OMB staff, PSRO program managers, and other evaluators and researchers. Since it is primarily an analytical document, this volume does not focus on programmatic recommendations, but rather provides information for those having the legal and administrative mandates to develop and implement specific program recommendations.

This executive summary contains three major components. The first, the Introduction and Summary, provides a comprehensive overview of the evaluation. The second component, comprising sections 2 through 7, provides details on the context of the evaluation and individual component studies. The last component, section 8, deals with directions for future evaluation activities.

1.1.1 PSRO Program Mandate and Implementation

The mandate underlying the PSRO program is contained in the Social Security amendments of 1972 (P.L. 92-603). Specifically, PSROs

were established under this statute:

> "...to promote the effective, efficient, and economical delivery of health care services of proper quality for which payment may be made (in whole or in part) under this Act and in recognition of the interests of patients, the public, practitioners, and providers in improved health care services, it is the purpose of this part to assure, through the application of suitable procedures of professional standards review, that services for which payment may be made under the Social Security Act will conform to appropriate professional standards for the provision of health care...1/

The PSRO program legislation was enacted during a period of increasing congressional concern over Medicare and Medicaid program expenditures. A careful reading of the congressional testimony prior to the enactment of P.L. 92-603 reflects a strong interest in controlling health care costs by eliminating unnecessary services. The text of the statute addresses this concern, but in the context of health care quality control.2/

Thus, the PSRO program has operated under a dual mandate. On the one hand, it endeavors to ensure that the Federal dollars for health care are being expended in the most efficient and economical manner, and on the other, it ensures that professional standards are observed in the provision of care. These responsibilities are inextricably linked, but have been often viewed so as to give one area more emphasis than the other. This evaluation does not argue the point but rather explores both dimensions by characterizing the mandate of the PSRO program as the determination of the medical necessity of care, which has implications for both health care expenditures and quality.

1/ 42 USC 1301, Sec. 1151

2/ See section 2.1.2 for a more complete development of this topic.

The National Professional Standards Review Council and the medical profession have emphasized the quality assurance aspects of the PSRO program. It is important to note that quality assurance advocates have noted that health care costs might well increase if quality objectives were the exclusive concern of the PSRO program.

Because of the relative immaturity of the program and the related constraints on data available for evaluation, this report concentrates on utilization data, which are more closely related to expenditures than quality. With regard to quality, the evaluation confirmed that the MCE component of the quality assurance process is currently well implemented, but the profile analysis component still lacks substantive development. Data was not available to assess actual impact of the PSRO quality assurance process on quality of care and patient outcomes, but such a study should be possible at a later stage of the program. A limiting factor in such a study will be the present lack of reliable, valid, and adequately sensitive measures for these variables. Several promising measurement methodologies are currently being discussed in the literature and may be useable for a future PSRO study.

The PSRO legislation provided for the immediate implementation of review of Federal acute inpatient care, the eventual phasing in of Federal long term care and made Federal ambulatory care review optional. At the time of this evaluation (1977), only Federal inpatient care review was developed sufficiently to provide evaluation data. Thus this current evaluation must be viewed within the context of partial implementation.

The PSRO program, in its current stage of implementation, encompasses three principal components concerned with health care rendered to Medicare and Medicaid patients in the acute hospital setting.[1/] These

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[1/] See section 2.2.2 for a more complete treatment of programmatic components.

include concurrent review (CR), medical care evaluation studies (MCE studies), and profile analysis.

The major portion of program funds thus far has been expended on concurrent review, which was designed to assess the medical necessity and appropriateness of hospital admissions and lengths of stay through the review of individual patient episodes while the patient is in the hospital. Medical care evaluation studies examine, on a retrospective basis, selected areas of hospital care with the objective of discovering and correcting problems. Both CR and MCE studies are accomplished through the application of locally developed criteria, norms and standards.[1/] Profile analysis is the computerized pattern analysis of data from discharge abstracts on patient treatment and hospital utilization. Profiles are to be "reviewed on an ongoing basis with respect to each health care practitioner and provider to determine whether the care and services ordered or rendered are consistent with the criteria" specified in the law.[2/] Relatively little effort has been expended on profile analysis to date. The actual performance of CR and/or MCE studies may be delegated by the PSRO to provider institutions which demonstrate a capability and desire to perform these review functions. Profile analysis is always performed by the PSRO.

Individual PSRO projects pass through three stages of development and funding. The planning stage comprises the development of review plans and organizational structure and provides for the enrollment of physician members. The conditional stage lasts at least 24 months and ensures that

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[1/] PSROs are free to develop their own criteria and norms, but in most cases they are derived from the American Medical Association Criteria Set and the Professional Activity Study regional length of stay norms.

[2/] 42 USC 1301, Sec. 1155(a)(4).

the PSRO is operationally viable before being fully designated. Finally, in order to be fully designated as operational, a PSRO must be satisfactorily performing both short-term and long-term care review. There are no fully operational PSROs at this time.[1/]

1.1.2 PSRO Evaluation: Mandate, Objectives, and Scope

The statutory mandate underlying the evaluation of the PSRO program is contained in the 1972 Social Security Amendments as part of the duties and reporting requirements of the National Professional Standards Review Council (NPSRC). The Council is required to:

(a) "review the operations of...Professional Standards Review Organizations with a view to determining the effectiveness and comparative performance of such...organizations..."[2/]

(b) "make or arrange for the making of studies and investigations with a view to developing and recommending to the Secretary and to the Congress measures designed more effectively to accomplish the purposes and objectives of [the PSRO program]..."[3/]

(c) "...not less often than annually, submit to the Secretary and to the Congress a report on...the findings of its studies and investigations together with any recommendations it may have with respect to the more effective accomplishment of the purposes and objectives of [the PSRO program]....Such report shall also contain comparative data indicating results of review activities conducted pursuant to this part, in each State and in each of the various areas thereof."[4/]

[1/] Of the 203 PSRO areas, there were 64 with planning PSROs and 108 with conditional PSROs as of August 1977. Physician groups in several more areas are expected to be awarded planning contracts by the end of this year. After January 1, 1978, nonphysician groups may be awarded contracts. By mid-1978, all areas are expected by the Health Standards Quality Bureau, HCFA, to have planning, conditional or fully designated PSROs.

[2/] U.S. Congress, The Social Security Amendments of 1972, P.L. 93-603 92d Cong., 2d sess., Section 1163,(e),(3).

[3/] Ibid., Section 1163,(e),(4).

[4/] Ibid., Section 1163,(f).

The document, Program Evaluation Plan: Professional Standards Review Organizations was prepared "to provide a detailed plan for how the PSRO program will be evaluated."[1/] This document which related to acute care inpatient portion of the program, was accepted by the National Professional Standards Review Council in late 1975 as the planning basis to be used in designing the evaluation of the program. The basic evaluation issues investigated in this current evaluation were selected from this document. This set of issues comprise the following:

(a) "Have admission certification and continued stay review (concurrent review) been effective methods of reducing medically unnecessary hospital utilization?"

(b) "Is retrospective health care review, as carried out by the PSRO program, an effective method of assessing the quality and appropriateness of the utilization of services?"

(c) "What has been the effect of PSRO activities on health care expenditures in the United States?"[2/]

Because of the importance attached to the current evaluation by DHEW, a special ad hoc advisory group was established at its outset to guide OPEL/HSA staff on general study design questions. This group consisted of representatives from the Office of the Assistant Secretary for Planning and Evaluation, the Office of the Assistant Secretary for Health, the Office of the Comptroller, the Health Care Financing Administration, and the Office of Management and Budget.

The selection of the basic issues for the current evaluation, enumerated above, was accomplished in close consultation with this group.

[1/] U.S. DHEW, Office of the Assistant Secretary for Health, Office of Professional Standards Review, Program Evaluation Plan: Professional Standards Review Organizations, September 22, 1975, p. 2.

[2/] Ibid., pp. 11, 12, and 17.

These issues and a preliminary study design were presented to the NPSRC in the fall of 1976;[1] thereafter, the NPSRC was informed on a periodic basis of the progress of the evaluation effort.

The current evaluation comprises a series of studies, each of which bears relevance to one or more of the selected evaluation issues. These studies fall into four general categories:

(a) Utilization Studies: These studies focus directly upon assessing the impact of PSRO review upon hospital utilization and serve as the basis for estimating impact upon associated health care expenditures.

(b) Cost Studies: This set of studies addresses the costs of performing preliminary outcomes of PSRO retrospective review activities as reflected in PSROs' MCE studies.

(c) Case Studies: A series of case studies was conducted in order to observe variations in PSRO structure and operations and to observe how PSROs fit into their operating environments.

(d) Quality of Care Studies: One quality-oriented study, focused on the implementation the MCE process, was conducted.

The primary set of studies was supplemented by analyses dealing with the status of PSRO program implementation, nonquantifiable aspects of PSRO program impact, the influences within the health care environment which could impinge upon PSRO program operation, the cost-containment implications of utilization control and the development of exploratory cost-benefit methodologies.[2]

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[1] The basic evaluation strategy was accepted by the NPSRC in the form of an OPEL document, "Fiscal Year 1977 PSRO Evaluation Strategy," dated November 12, 1976.

[2] This report does not deal with PSRO implementation in depth. However, the General Accounting Office is completing a review of the progress and problems of PSRO implementation to date. The report is expected in early 1978.

1.1.3 PSRO Evaluation Accomplishments and Limitations

Before discussing evaluation results, it is important to highlight study weaknesses as well as strategies. This subsection briefly (1) discusses the implications of the current stage of PSRO program development and resultant sample frames used in evaluation studies, (2) highlights the fact that the evaluation uses the PSRO area as the unit of analysis, (3) indicates study accomplishments, and (4) pinpoints those conclusions which the data and analysis can support.

1.1.3.1 Current PSRO Program Development and Sample Frames Used

Over the time period during which this evaluation was conducted, only 63 (31%) of the 203 designated PSRO areas had conditional PSROs and even a smaller subset of these had sufficient review experience to permit assessment of impact. In particular, with respect to the analysis of the relationship of PSRO CR to Medicare utilization rates, only 24 PSROs met minimal conditions for evaluation (i.e., 50% of Medicare discharges were under PSRO review by January 1976). From that number, six were subsequently removed because of inadequate comparison or baseline data. The resulting 18 areas became the basis for the Medicare analysis. Other evaluation analyses were similarly restricted in terms of the number of available active PSRO areas. Medicare admissions under review in the 18 active PSRO areas used in the Medicare data analysis represent 38% of the Federal beneficiaries in all active PSROs as of June 1976 and about 10% of the total annual Federal beneficiary admissions for 1976.[1/]

[1/] Note that Federal beneficiaries include Medicare, Medicaid, and Title V patients.

An additional fact is that the active PSRO areas were over-represented by western region PSROs. The group of active PSROs was distributed as follows: Western--44%; Southern--28%; North Central--22%; and North Eastern--5%. Western states, which already exhibited relatively short length of stay and low admission rates, may represent areas where baseline utilization levels, already low, are resistant to further reduction. Southern and Eastern areas of the country have little organizational experience with PSRO type review. As they develop more review experience their PSROs may show more impact. Interestingly enough, however, study results indicated that PSRO impact appeared to be distributed independent of regional location. Thus, while Western overrepresentation may appear logically to bias the findings, empirical results did not appear to confirm this source of bias.

The limited scope and nonrepresentativeness of study samples is quite common in nonexperimental research designs. The PSROs were implemented in a highly self-selected order--a classic threat to generalizability of studies.[1/] The results of the evaluation studies--none of which are based on statistical probability samples of PSRO areas--may not be generalized to full implementation at the national level. However, the results contained herein do indicate current program performance as of 1976 and, in so doing, suggest possible strategies for improving the effectiveness of the program as it proceeds towards full national implementation. The studies also provide baseline data and methodologies for further inquiry.

[1/] Campell, D., and Stanley, J., Experimental and Quasi-Experimental Designs for Research, Rand McNally and Company, Chicago, 1969.

The limited development of the program has implications beyond questions of sample frames. The active PSRO areas viewed were, for the most part, represented by new and emerging organizations. As these organizations mature and influence increasing numbers of practitioners, their effectiveness may change.[1/] The PSRO program will also soon expand beyond acute inpatient care review to long-term care and, eventually, ambulatory care review. The review of these may produce more appropriate patient treatment patterns. Additionally, linkages with other organizations attempting to rationalize health care system behavior, such as cost commissions, and health systems agencies may also develop. These changes should affect the PSROs' ability to affect the health care system.

1.1.3.2 Evaluation Focus: The PSRO as the Unit of Analysis

In this evaluation every attempt was made to focus on the PSRO as the unit of analysis. Accordingly, the "treatment" under investigation was the implementation of PSRO binding review over a majority of Federal beneficiary discharges in a PSRO area.[2/] There are several characteristics of PSRO review which distinguish this treatment from other utilization review efforts:

[1/] This is partially supported by the Medicare analysis finding that there is a small but statistically significant interaction between impact and the length of time the PSRO has been doing review. It should be noted, however, that evidence from two case studies suggests that program effect on utilization is exerted within approximately the first year and then diminishes.

[2/] The hospital discharge abstract analysis is a partial exception. Fourteen percent of the PSRO review hospital sample were from areas with less than fifty percent PSRO review as of December 31, 1975.

(a) PSROs are structured organizations created solely for the purpose of implementing the law. Previously, utilization review has been left to individual hospitals, with supervisory responsibility divided between State certification survey agencies and fiscal intermediaries.

(b) PSROs are physician-sponsored organizations, in contrast to State agencies or fiscal intermediaries.

(c) PSRO Memoranda of Understanding with State Agencies and fiscal intermediaries assures that PSRO review decisions on medical care necessity are binding on the fiscal agent, thereby precluding any retrospective denial of the claim by the fiscal agent on the grounds the stay is not medically necessary. Prior to PSRO, utilization review called for decisions by fiscal intermediaries on all issues of patient eligibility, coverage and medical necessity.

(d) PSRO implementation has been formally guided through a structure of transmittals, support centers and technical assistance. This has tended to produce greater uniformity than other utilization review (UR) implementation strategies.

(e) PSRO concurrent review employs uniform norms and standards established on an areawide basis. In contrast, norms for other forms of concurrent review varied from hospital to hospital.

Given these characteristics, the evaluation findings indicated the degree to which PSRO-induced review procedures produced results different from the utilization review programs conducted by hospitals prior to the official implementation of PSRO review in an area.

It should be noted that the contrast of interest (i.e. PSRO versus UR) is downward biased to the extent that the enactment of the law induced

additional "spillover" medical care review activities in all areas of the country. To the extent that "spillover" existed, the evaluation underestimated the impact of PSRO legislation on utilization. In other words, this study may have underestimated the impact of CR on utilization rates because of possible contamination of comparison areas by program "spillover".

1.1.3.3 Study Accomplishments

This evaluation was in many ways only a first effort at comprehensive PSRO evaluation. As such, the evaluation served to validate evaluation methodologies, develop baseline data and measure the impact of the program as of 1976 with data then available. In particular this evaluation provided:

(a) The first comprehensive assessment of the costs of conducting review of Federal beneficiary inpatient hospital care, including the costs of various components of PSRO review, prior utilization review carried out by hospitals, and review performed by Medicare intermediaries and Medicaid State agencies.

(b) The first application of hospital utilization rate analysis drawing comparisons between a large number of PSRO and matched comparison areas in assessing the impact of PSRO concurrent review.

(c) The first aggregate analysis of length of stay and patient characteristics in hospitals performing PSRO review compared to non-PSRO hospitals, across numerous geographic areas.

(d) The first empirically-based application of a cost-benefit perspective to the PSRO program.

(e) The first comprehensive analysis of medical care evaluation studies as conducted by PSROs.

1.1.3.4 Key Conclusions

While keeping in mind that the PSRO program has not yet been fully implemented, and that definitive evaluation findings are, therefore, impossible, this "first" evaluation of the PSRO program did suggest the following:

(a) PSRO represents a more costly system of hospital care utilization review than systems operating under either the original UR regulations or the revised regulations of November 29, 1974. Under the policy of targeted review, assuming review of 20% of all Federal acute care episodes in 1976, PSRO would have cost $184 million. The incremental costs of targeted review over pre-1975 UR would have been approximately $102.6 million. The incremental costs of targeted review over the revised UR regulations of November 29, 1974 would have been $76.4 million. If 100% review has been employed for all Federal patient episodes in 1976, the cost would have been $268.5 million. The increment over pre-1975 UR regulations for this 100% option would have been $187.2 million, while the increment over the revised regulations would have been $161 million.[1/]

(b) Medical care evaluation studies, as carried out by PSROs and their delegated hospitals, appear to be effective means of identifying and correcting clinical and administrative deficiencies in care, but the frequency of the required reaudits is thus far not adequate.

(c) No aggregate statistically significant PSRO effect was found on adjusted days of care rates or adjusted admission rates.[2/] This implies that as a treatment the PSRO program thus far has not impacted on adjusted utilization relative to other forms of review being conducted in comparison (non-PSRO)

[1/] The 20 percent figure was an arbitrary choice for purposes of illustration, and does not necessarily reflect an appropriate level of targeted review for the PSRO program.

[2/] Adjusted utilization is adjusted for demographic characteristics.

areas. While no aggregate effect was observed, some individual PSROs showed decreased raw utilization (favorable) relative to their matched comparison areas. However, other reflected higher (unfavorable) raw utilization changes relative to their matched comparison areas.[1/]

(d) Analysis of average length of stay (ALOS) data produced mixed results. Analysis of Medicare ALOS by PSRO area indicated no PSRO impact. However, an analysis of hospital abstract data for a group of PSRO hospitals using PAS or CHDC abstracting showed small but favorable results for Medicare patients in hospitals under PSRO review compared to similar patients in comparison hospitals and small but unfavorable results for Medicaid patients. When these results are pooled, the hospital abstract data indicated a very small (less than 1/10 of a day) favorable effect on average length of stay.

(e) There was some evidence that case mix severity had increased in PSRO hospitals relative to matched non-PSRO hospitals. This would imply a more effective allocation of hospital beds.

(f) PSROs, acting primarily on appropriateness of utilization, have little potential to countervail or reduce the inflation to input prices and technology which are the major causes of the rapid rise of hospital care expenditures. Thus, PSROs should not be considered a stand-alone, cost-containment strategy, but rather as one important part of a comprehensive strategy of rationalizing the price, supply, use, and eventual expenditures related to the delivery of health care services.

1.2 Study Findings

This section briefly explains the study approaches taken, summarizes the major findings of evaluation study components, and presents discussion related to study findings.

1/ Raw utilization is unadjusted for demographic characteristics.

These findings are presented in the following order: Program Status, Utilization Impact, Review Costs, Medical Care Evaluation Studies, Secondary Effects, and Cost-Benefit Analysis.

1.2.1 Program Status

As of August 1977, there were 108 conditional PSROs and 64 planning PSROs in the 203 PSRO areas.[1/] In the conditional PSRO areas, approximately 60% of the hospitals were under review, 30% of the Federal discharges were under review, and 55% of the local practicing physicians were members. Delegation of review activities from the PSRO to the hospital clearly was being exercised by many PSROs. Approximately 70.3% of the hospitals doing review were fully delegated; 6.1% were partially delegated and 23.6% were nondelegated.

Review activities have been implemented gradually in the conditional areas. Initially, the PSROs have instituted CR in short-term hospitals. MCE studies generally follow by approximately one year. Profile analyses have been delayed due to the complexities involved in establishing the necessary data systems. The Washington-based PSRO Management Information System (PMIS) is not yet fully implemented. Long-term care and ambulatory care review demonstration programs are now being conducted in some PSROs.

Individual PSROs have been observed to vary considerably in their organization and operation as a function of the unique combination of characteristics in leadership and operating environments. This variation is reflected in differences in governing board compositions, committee structures, the use of review coordinators, the proportion of review delegated

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[1/] Area designations in two States are presently pending.

and the use of implicit or explicit criteria. Preadmission review is not widely utilized. Focused review, while allowed by the PSRO statute, is rarely conducted.[1/]

An overriding concern relevant to the growth and development of the PSRO program relates to the need for a mechanism to translate utilization control efforts of PSRO review into changes within the health care system. Health care system implications of PSRO review are, in part, dependent upon an effective working relationship between PSROs and Health Systems Agencies (HSAs). If PSRO-induced reductions in utilization are to be related to reduced health care expenditures, effective action must be taken by local HSAs to eliminate unnecessary hospital beds and to provide for alternative forms of care which complement acute care inpatient facilities. Case study visits conducted during the summer of 1977 indicated that such coordinated activity is currently only in the earliest developmental stage in active PSRO areas. In fact, PSROs, HSAs and cost commissions are now often in conflict on such issues as data availability and the setting of occupancy rates.

1.2.2 Utilization Impact

Two broad-based studies addressed the question of the effects of PSRO concurrent review of short-term hospital utilization. One primarily addressed PSRO CR impact upon rates of hospital utilization of Medicare patients. Three primary utilization measures were used in this study: days of care per thousand enrollees, admissions per thousand enrollees, and average length of stay (ALOS). This study analyzed a data base derived from Medicare claims history files expressly for this study. It should be noted that

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[1/] Focused review concentrates on certain problem diagnoses.

comparable Medicaid rate data were not available for analysis when this study was initiated.[1/] The second study focused upon changes in length of stay and diagnosis-specific characteristics of Medicare and Medicaid patients as influenced by PSRO CR. This study is based upon data obtained from two hospital discharge abstract services.[2/]

1.2.2.1 Concurrent Review Impact on Hospital Utilization Rates (Social Security Medicare Rate Analysis)

Medicare hospital utilization rate data were analyzed for 18 active PSRO areas in comparison with 26 nonactive PSRO areas. Active and nonactive areas were matched on fifteen selected demographic and health systems characteristics known to be related to the dependent variables, a procedure methodologically preferable to matching on the dependent variables. An active PSRO area was defined as any PSRO area which achieved review (binding for purposes of claims payment) of at least 50% of Medicare discharges in the area by January 1976. All areas meeting this definition were included in the analysis with the exception of two which had a history of pre-PSRO concurrent review of Medicare hospitalizations and four for which no appropriate matched comparison areas were available.

[1/] Medicaid Rate Data for discharges and total days in Mississippi have been analyzed by HSQB. Results will be available in an unpublished report by Jane Crane, MA and Korbin Liu, Sc.D., Spring, 1978.

[2/] Discharge abstract services, such as the Professional Activities Study (PAS) of the Commission on Professional and Hospital Activities (CPHA), provide voluntarily subscribing hospitals with services such as regular reports on utilization, patient characteristics, quality of care indicators, diagnosis and surgery indexes (such as those required by the Joint Commission on Accreditation of Hospitals), and special studies based on information which each hospital abstracts from discharge patients' medical records and codes into a form provided by the service.

The study derived its conclusions by comparing adjusted differences in utilization rates between 1974 (baseline period) and 1976 (PSRO period) among the active and matched nonactive comparison areas.[1/] Utilization data were statistically adjusted for the following:

(a) baseline (pre-PSRO) utilization levels,

(b) population density,

(c) percent of families with less than $5000 income,

(d) hospital beds/100,000 population,

(e) weighted PSRO-wide hospital occupancy rates,

(f) prior Medicaid concurrent review.

The net effect of adjustments for these factors was to better isolate the unique effects of PSRO CR upon hospital utilization rates.

Two types of analyses were performed: aggregate (comparing active and nonactive PSRO areas as a group with appropriate statistical adjustments) and disaggregate (individual raw (unadjusted) contrasts of active PSROs and their own matched comparison nonactive PSROs). The aggregate analysis provided a stronger base for statistical inference. The disaggregate analysis was useful to identify those PSROs which appeared to be controlling utilization relative to their comparison areas.

Study Findings

The changes in utilization were expressed as percentages computed by comparing 1976 expected values, as forecast from baseline and demographic data with 1976 actual active PSRO area utilization values.

[1/] The term "comparison area" is used because no scientific "control areas" were available; i.e., all non-PSRO areas had some other form of utilization review.

- In aggregate, no statistically significant overall PSRO effect was found on average lengths of stay, days of care/1,000 enrollees or admissions/1,000 enrollees.
- The aggregate analysis showed a small but significant interaction between hospital bed availability and impact, those active PSROs with a higher number of beds per thousand population were more likely to demonstrate a reduction in live days of care than were those with a lower number of beds per thousand population.
- The disaggregated analysis identified PSRO areas which appear to be reducing hospital utilization relative to their matched comparisons and some which appeared to be increasing utilization relative to their comparisons. About 40% (7 of the 18) active PSROs studied were found to have lower (favorable) actual rates than would be expected if there were no PSRO effect. About 60% (11 of the 18) active PSROs studied had either no systematic variation of the actual from the expected rates, or actual rates higher than expected. These findings, combined, are not significantly different from chance expectation.[1/]
- Of the seven PSROs showing lower actual rates of days of care than expected, six had imputed dollar savings greater than the incremental costs of PSRO review, i.e., six were found to be cost-effective.

[1/] That is, the situation is analogous to 18 flips of a coin. Outcomes of 7 heads and 11 tails will not statistically support a finding that the coin is biased. Similarly, in a sequence of 18 trials, outcomes of 7 "winners" and 11 "losers" will not statistically support a finding of negative or positive impact on utilization. The correct finding is "no impact".

It should be noted again that any interpretation of this study rests on the fact that the PSRO was used as the unit of analysis and that the treatment under investigation was the implementation of PSRO binding review. While the results in that context are clear, it is less clear what they imply, generally, about the CR process apart from the PSRO organizational structure. If nonactive PSRO areas were not conducting any form of CR, study results could be interpreted to indicate that CR under PSRO is not affecting utilization and suggest that the CR process is not more effective than retrospective review. This unqualified conclusion cannot be drawn, however, because there was, during 1975 and 1976, some concurrent utilization review of varied nature and intensity in nonactive PSRO areas. There are no empirical data to determine the extent or intensity of CR in nonactive PSRO areas.[1/] Study results as they pertained to the impact of the CR process alone on utilization were inconclusive. The results indicated that PSRO review is no more or less effective than non-PSRO review as conducted by hospitals and fiscal intermediaries during 1976.

[1/] Discussions with personnel from most of the study PSROs and other knowledgable individuals indicated that CR implementation in nonactive PSRO areas in 1976 was mixed, with large hospitals in metropolitan areas likely to implement a PSRO-type concurrent review, but with small hospitals and the more suburban and rural hospitals unlikely to voluntarily implement PSRO-type concurrent utilization review. These statements are not inconsistent with the preliminary findings of a mail survey of hospitals, conducted by Dr. Paul Gertman of Boston University, to determine the nature and extent of utilization review in 1976. He found that "[w]hile there was a clear pattern of increase of UR activities nationally from 1973-1976, the type and extent of utilization review activities varied from hospital to hospital."

1.2.2.2 PSRO Concurrent Review Impact on Hospital Utilization Rates (The Colorado Medicare and Colorado Medicaid Rate Analyses)

Two modes of analysis were used. A detailed analysis of Colorado Medicare and Medicaid utilization by diagnosis and hospital type was conducted by comparing post review years 1974 and 1975 to a base year of 1972. Additionally, CAP-induced reductions in Medicare utilization were estimated by controlling for longitudinal changes which might have otherwise occurred in the absence of PSRO review. In order to estimate net savings in days of care/1,000 associated with CAP, SSA data on Medicare covered days of care/1,000 for residents of Kansas and Nebraska were used to estimate Colorado utilization in the absence of CAP. The percentage change in Kansas/Nebraska (combined) between a base period of 1969-1972 and the post-CAP years 1974 and 1975 was applied to pre-CAP Colorado utilization and the actual Colorado post-CAP utilization rate was compared with the rate thus estimated. CAP utilization savings (days saved) were estimated as the difference between the actual and the projected rates.

Study Findings

1. Analysis of a complete set of paid Medicare patient claims for short-stay, non-Federal hospitals in Colorado revealed the following changes in Colorado utilization relative to the pre-CAP base year 1972:
   - Total days of care per 1,000 enrollees decreased.
   - Discharges per 1,000 eligibles increased.
   - Average lengths of stay (ALOS) decreased.
   - Decreases in ALOS were twice as large for medical cases as for surgical cases. Surgical ALOS decreases were due entirely to shortening the post-operative stay.

The results of both longitudinal and comparative Colorado Medicare analyses show a general decrease in days per 1,000 following the introduction of CAP, but indicate different sources of the decrease. Within Colorado, an absolute decrease due to shorter stays was observed. In contrast, when compared to Kansas/Nebraska, lower rates of increase admissions per 1,000 are observed in Colorado, but length of stay decreased about the same in all three States.

2. Relative to Colorado Medicaid utilization in the base year 1972:
   - Medicaid days of care per 1,000 registered eligibles decreased.
   - Discharges per 1,000 eligibles decreased.
   - Average lengths of stay increased.
3. The general results of this study are findings of decreases on the order of 5-8% in both Medicare and Medicaid days of care/1,000 associated with the implementation of CAP concurrent review in Colorado. Methodological considerations in the comparative as well as the longitudinal analyses limit the degree to which these decreases can be fully ascribed to effects of the PSRO review program. However, two clear patterns emerged:
   - Impacts in succeeding years are lower than in the first full year of CAP review.
   - The major effect of CAP was achieved through moderation of the admission rates. To the extent that moderation of the admission rate is a CAP impact, it must be attributed to a voluntary compliance and, perhaps, subtle pressures since CAP pre-admission review of elective hospitalization has been entirely voluntary and denials of admission certification have never exceeded 25 per year (about 0.02% of admissions).
4. When the imputed cost savings of Medicare utilization reductions in 1974 and 1975 were compared to the costs of review of Medicare patients in Colorado, the CAP program was found to be cost effective.

1.2.2.3 PSRO Concurrent Review Impact on Length of Stay and Case Mix Severity (Hospital Discharge Abstract Study)

An analysis of 1.19 million hospital discharge abstract data records representing 92 PSRO review hospitals and 46 comparison hospitals[1/] produced information concerning length of stay and a limited amount of data on clinical characteristics of Medicare and Medicaid patients. It should be emphasized that these data were derived only from hospitals participating in certain medical record abstract services (primarily Professional Activities Studies (PAS) and, to that extent, are neither representative of hospitals across the nation nor of hospitals on other abstract services. Nor are results necessarily consistent with the Social Security Medicare rate analysis described in section 1.2.2.1. Rate data linking utilization to a population at risk (e.g., days per 1,000 enrollees) were not technically feasible for the hospital discharge abstract study because no denominator (enrollee) data was available for hospital trade areas.

Study Findings

- With respect to ALOS for Medicare patients under review in the sample hospitals a .23-day larger drop in ALOS (equal to about 2% of the preperiod ALOS of 10.7 days) was observed when compared with Medicare patients in sample hospitals not under PSRO review.
- For Medicaid patients under review in sample hospitals, the opposite result was found--their absolute ALOS decreased, but by .20 days less than for comparison groups. These changes in ALOS were simultaneously

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[1/] The figures are 77 and 51, respectively, for the Medicaid portion of this analysis.

adjusted for case mix, region, and major hospital and area medical resources characteristics and were statistically significant.[1/2/] The combined effort in ALOS for both Medicare and Medicaid patients was slightly favorable (.09 day decrease).

- A decrease in the percentages of both Medicare and Medicaid long-staying patients[3/] (statistically significant only for Medicare) was associated with PSRO review in the sample.
- While PSRO review was associated with small and mixed effects on length of stay patterns in hospitals on abstract services in general, the length of stay effects were greater for nondelegated PSRO hospitals than for delegated hospitals.
- An overall trend was found towards increasing severity of inpatient diagnostic mixes in both PSRO and non-PSRO hospitals. Expected lengths of stay, based on PAS regional lengths of stay in 1975 for patients matched on diagnosis group age, single vs. multiple diagnosis, and operated vs. not operated, increased for all the patient groups. This indicates a trend towards a patient mix more consumptive of patient days. Severity of case mix was also examined using the SysteMetrics "Staging Methodology" for 23 specific diagnoses.[4/] The method estimates illness

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[1/] Low diagnostic specificity of data in medical record abstracts observed for certain diagnoses and procedures found by the Institute of Medicine's reabstract study (Reliability of Hospital Discharge Abstract, February 1977, National Academy of Sciences, Washington, D.C.) suggests that the case mix adjustment may have been less than fully effective.

[2/] At the 5% level using two-tailed t tests.

[3/] Where long-staying patients are defined as stays longer than the 75th percentile for "matched" patients in all CPHA hospitals in 1975.

[4/] Gonella, J. and Goran, M.J., "Quality of Patient Care - A Measurement of Change: The Staging Concept." Medical Care 13:467-473, 1975, and Gonella, J., Louis, D.Z., and McCord, J.J., "The Staging Concept: An Approach to the Assessment of Outcome of Ambulatory Care." Medical Care 14:13-21, 1976.

severity from discharge diagnoses and other clinical information in terms of the natural progression of untreated illness. For example, simple appendicitis represents stage I, while appendicitis with perforation and localized peritonitis is stage II. The percent of patients at stage I was used to evaluate case mix changes. Focusing on Medicaid patients only, this trend was more pronounced in the PSRO hospitals than the non-PSRO hospitals, suggesting that PSRO may be discouraging the admission of Medicaid patients having less severe clinical problems. Findings related to severity are considered tentative because the indication of increased severity may eventually be attributed to unreliable diagnosis coding, changes in diagnostic coding behavior, the tentative nature of the severity measurement technique employed, or by an increased emphasis on careful record-keeping generally observed in PSRO hospitals.

1.2.2.4 Discussion

This section discusses the above utilization findings in terms of health care expenditures and appropriateness of care.

The Relationship of Utilization Control to Health Care Expenditures: The logical relationships between cost-containment and PSRO program attempts to control utilization are explored in this section.[1/] The utilization studies indicate that, in aggregate, the PSRO program exerted minimal influence on utilization rates of acute inpatient hospital services in 1976. The following discussion attempts to determine what types of influences the PSRO program would need to have on utilization before it could

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[1/] For a more thorough discussion see, A. Fenton, "A Cost Containment Perspective," HSA/OPEL Working Paper, December 1977.

be considered an effective cost-containment device. The thrust of the arguments presented is that the PSRO program does not logically appear to be a primary mechanism to control hospital expenditures. To exert even minimal cost-containment impact the PSRO program effect on utilization must be considerable--much larger than could reasonably be expected given the incentives confronting both consumers and providers in the existing health care system and the preliminary empirical data. Thus, the PSRO program in and of itself represents a limited influence on costs and more appropriately should be considered a part of an overall cost-containment strategy.

Before a program can effectively contain inpatient acute care hospitalization expenditures, it must exercise some control over those factors significantly related to expenditures. These factors include:

(a) the price of materials and wages;
(b) the rate of increase in complexity of health care services provided due to technological advancement and shifts in medical care practice;
(c) third-party coverage patterns and controls on reimburseable costs;
(d) population (size, age distribution, and health status);
(e) the rate of increase in the supply of health care resources representing increased fixed costs to be amortized and induced demand; and
(f) utilization and case mix.

The PSRO program is, in fact, only one aspect of a comprehensive cost-containment strategy in that it restricts its cost-containment focus to utilization pressures that affect expenditures. This is to be expected since the PSRO program has no legislative mandate to control other causal

factors. While estimates of the relative influence of causal factors vary, it is generally agreed that in recent years utilization has represented a secondary influence on the rate of hospital spending.[1,2,3,4] For example, modest reductions in hospital occupancy rates are seen to produce little, if any, reduction in staffing and fixed costs. Total expenditures are merely distributed across a somewhat smaller utilization base. Thus, a decline in volume produces increases in hospital unit prices that maintain revenues equal to expenditures.

From the perspective of the Medicare and Medicaid programs, this implies that days saved do not necessarily translate into a reduction in reimburseable costs. Or, stated another way, while the PSRO program might be able to constrain somewhat the quantity of care utilized, it is apt to have little direct influence on the cost of resources consumed by the hospital unless combined with pressures from planning bodies such as Health Systems Agencies (HSAs) or explicit cost reimbursement ceilings as proposed in H.R. 6575.

1/ Congressional Budget Office, Expenditures for Health Care, Federal Programs and Their Effects, (August 1977), p. 28.

2/ Council on Wage and Price Stability, "Labor-Management Innovations in Controlling Cost" Part III, Federal Register (Sept. 17, 1976, pp. 40309, and 40311).

3/ Council on Wage and Price Stability, Executive Office of the President, "The Rise of Hospital Costs," (January 1977), p. iii.

4/ American Hospital Association, Hospital Statistics, 1976 Edition from 1975 Annual Survey, p. XIV.

Expenditures are a product of both unit price and quantity consumed. The factors that directly affect price are numerous. Specifically, wage pressures, inflation, supply pressures which increase fixed costs, reimbursement incentives, and more costly and numerous technological inputs increase the price of services provided by hospitals. Clearly, the PSRO program does not control this broad range of factors.

In order to offset the multiple and direct pressures on price, PSROs would have to cause a substantial reduction in the total number of patient days. It is not unreasonable to suggest that if utilization were significantly reduced, secondary benefits would result, e.g., demand pressures on wages and inputs would be diminished, underutilized facilities would close, etc. However, in an era characterized by continued increases in nearly all health care activities, it would be unrealistic to expect more than a general decrease in utilization growth rates or small absolute decreases at best.[1/]

The above statements imply that the PSRO program lacks leverage as a cost-containment device. To further illustrate this contention, if the PSRO program "saves" days of hospital care that are equivalent in dollars to PSRO program costs (i.e., a cost-benefit ratio of one to one), the program is just "breaking even" from a cost-containment perspective.[2/] Under these circumstances the program is not containing costs in that expenditures added to the system are merely recovered. To

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[1/] In addition, from a medical perspective, it may be that large changes in utilization rates are actually unwarranted. To date there is no quantitative measurement of inappropriate utilization, and development of a measurement methodology is hindered by lack of general agreement on detailed standards of care.

[2/] Note that benefits are measured as the dollar value of days saved due to PSRO activities.

be effective as a cost-containment device the PSRO program would have to demonstrate benefit-cost ratios on the order to 2:1, 3:1 or even higher. The cost-benefit material presented in section 7 indicates that while some individual PSROs may approach these levels, the program's aggregate benefit-cost ratio in 1976 was currently well below one.[1/] This finding is perhaps not surprising, since the PSRO program is currently in its developmental stage. Large, complex systems such as the health care system are not changed substantially in one or two years. For these reasons, the results of this study simply provide a baseline against which future successes of the program can be compared and suggest the difficulties that might lie ahead.

Appropriateness of Care: A fundamental assumption underlying the development of the PSRO legislation was that the rendering of inappropriate care was in part, responsible for the continuing increases in Medicare and Medicaid program expenditures. Appropriateness may refer to whether it is medically necessary that the patient be cared for in the hospital rather than a nursing home or an ambulatory care setting. It may also refer to the medical necessity for the treatment prescribed for the patient, e.g., the tests conducted or procedures employed.

During the planning stages of the evaluation, attempts were made to define measures which would indicate decreases in inappropriate care. This effort was frustrated, for the most part, by the nature of the data available. As a result, the ultimate relationship between the study's

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[1/] Had the PSRO program utilized targeted review in 1976 these figures might have been more favorable.

primary utilization variables and appropriateness of care is less than clear. For instance, the study's empirically identified decreases in hospital utilization rates may indicate less inappropriate care or, alternatively, failure to prescribe necessary care.

While, as noted above, we were not able to measure appropriateness, much indirect evidence suggests that inappropriate care may exist. Widely divergent patterns of hospital utilization rates and lengths of stay exist across the country.[1/] Similarly, studies have demonstrated that hospital admission rates of participants in prepaid group practice plans tend to be significantly lower than groups not participating in such plans, without apparent negative effects on health status.[2/] Likewise, studies of second opinion surgery programs have demonstrated reductions in surgical rates.[3,4/] Such studies tend to support hypotheses that medical judgment plays a large role in determining the extent to which facilities are used and services are rendered. Logically, to the extent that medical judgment is subject to change,

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[1/] M. Gornick, "Medicare Patients: Geographic Differences in Hospital Discharge Rates and Multiple Stays," Social Security Bulletin (June 1977).

[2/] For example see D. Riedel, et al, Federal Employees Health Benefit Program Utilization Study, (January 1975). A. Donabedian, "An Evaluation of Prepaid Group Practice, "Inquiry" (September 1969). H. Klarman, "Effect of Prepaid Group Practice and Hospital Use," Public Health Reports (November 1973). G. Sparer, A. Anderson, G. Adler, "Influence of Ambulatory Health Care on Inpatient Hospital Utilization," paper presented at APHA, October 1976.

[3/] Subcommittee on Oversight and Investigations of the Committee in Inter-State and Foreign Commerce, Cost and Quality of Health Care: Unnecessary Surgery, U.S. House of Representatives (January 1976).

[4/] E.G. McCarthy and G.W. Widner, "Effects of Screening by Consultants on Recommended Elective Surgery", The New England Journal of Medicine, (December 19, 1974).

peer review has the potential to direct physician behavior towards increasingly appropriate usage of facilities or services. On the other hand, more appropriate utilization may, in some few areas, be one of increased usage, rather than decreased hospital usage. For the purpose of this report, it is assumed that reductions in utilization are desirable.

Data derived from the Medicare rate analyses suggest that in seven of eighteen PSROs studied relative reductions in the rates of hospital utilization occurred which may possibly be attributed to PSRO CR.[1/] In addition, the hospital abstract data study indicated that the following may be attributed to PSRO: higher levels of Medicaid patient illness severity at admission, relative declines in ALOS for Medicare patients, and the relative decline in the percentage of long-staying patients for both Medicare and Medicaid.

In an effort to assess changes in the appropriateness of services rendered, diagnosis-specific data were analyzed from the sample of hospital abstracts. This analysis did not identify any post-PSRO patterns of change. While this and the above cited results indicate little or no change in such approximate and indirect measures of "appropriateness" of hospital utilization, much work remains to be done in the definition and measurement of appropriateness before any definitive statements can or should be made.

1.2.3 Medical Care Evaluation Studies

Medical care evaluation studies are intensive retrospective reviews of health care in which the staff of a PSRO or a delegated hospital apply explicit criteria to a sample of patient records in a selected

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[1/] However, increases in relative rates were also found, and this casts some doubt on any positive statement of benefit from the PSRO program.

topic area, document reasons for variations from the criteria, and perform a reaudit to see that deficiencies have been corrected. Medical care evaluation studies may be conducted within individual hospitals or across groups of hospitals.

The MCE component of a PSRO has typically been implemented about one-year after the implementation of concurrent review. Data on MCE implementation are available through quarterly activity reports submitted by the PSROs to the PMIS.[1/] As of June 1, 1977, 56 PSROs had reported 2,876 MCEs completed through the initial audit for the calendar years 1975 and 1976. The numbers completed per quarter are continually growing; the latest figures indicate 1,342 audits were done in the first quarter of 1977. Equal proportions of topics have been chosen in medical and surgical areas (about 45% each), with the remaining 9% of studies examining administrative and miscellaneous procedures. Myocardial infarction, pneumonia, cholecystectomy, and appendectomy were the four most frequently audited topic categories, with the top twenty topic categories accounting for over half of studies reported.

When a sample of 37 complete MCEs was examined (including both audit and reaudit, done on the four most frequent topic categories), it was found that 100% of the studies revealed deficiencies in care and that 68% of these deficiencies had been removed by the time of the reaudit. The main problems occurred in the areas of diagnosis, treatment, appropriateness of utilization, outcome, and documentation of care. Medical care evaluation studies which have completed the full cycle thus demonstrate that such

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[1/] PSRO Management Information System.

audits and reaudits can effectively identify and correct problems. As of June 1, 1977, however, only 132 of these full-cycle studies had been entered into the PMIS.

Looking at the larger sample of 2,876 studies reported only through the initial audit, it was found that the topics selected correspond to the most frequent causes of hospital admission. Thus, in selecting topics the hospitals and PSROs are choosing those which involve the greatest number of patients, providers, and resources. It appears that such a rationale for topic selection is likely to reveal problems in care by the sheer magnitude of the topics addressed. It is not clear at this time whether topics are chosen to address perceived problems in care at the hospital level, or that the topics selected are on the whole adequately focused. Early information indicates that actions recommended as a result of MCEs are being implemented to remove problems in care. Because of a lack of reaudits PSROs are not currently aware of the degree to which their corrective actions are successful.

1.2.4 Secondary Effects

The evaluation primarily addresses the effects of PSRO on utilization control, dollars spent for medical care and reviews, and on the quality of the care delivered. There may be other effects of the program which are no less real but which are more difficult to quantify. The following impressions were gathered from observations, the literature, and interviews with program personnel:

- Participation in PSRO activities, such as criteria development, medical care evaluation, and profile analysis, is felt to have an educational effect for physicians with respect to consciousness of the system consequences (cost, utilization, quality) of clinical practice.
- Similarly, these activities may improve the quality of care by requiring physicians to meet and deliberate on optimum clinical procedures, often requiring them to re-examine the assumptions underlying the way they practice medicine.
- Courses in medical care appraisal, no doubt stimulated by the existence of PSROs, are beginning to be offered in some medical schools and schools of public health, thereby markedly increasing the number of physicians who will consider the systemwide implications of their personal medical practice in the future.
- Many observers feel that PSRO has pressured physicians to improve their documentation of care. The exposure of these records to systematic peer review has increased the ability of the medical staff to judge the quality of the work performed by its members.
- The existence of PSRO administrative structures and information systems has, in several instances, facilitated the implementation of other changes in the health care system. Professional Standards Review Organizations are usually better equipped than previous physician organizations to influence and assist such bodies as health systems agencies, planning agencies, and cost commissions.

1.2.5 Cost Analysis

Cost analysis represents a major component of the evaluation. Because of a lack of uniform accounting cost centers related to utilization

review components, all cost data was constructed from on-site, structured interviews and inspection of accounting records. Cost-finding (determining UR-related processes) and cost-building (allocating costs to UR processes through the use of accounting records) techniques were utilized to estimate cost data for the following organizations: hospitals, Medicare intermediaries, Medicaid State agencies, and PSROs.

Four major cost activities were undertaken to determine:

(a) costs of medicare intermediary UR-related activities,

(b) costs of Medicaid State agency UR-related activities,

(c) costs of delegated and nondelegated hospital review,

(d) PSRO administrative costs.

The sampling frames utilized in the cost studies, while not strictly random samples, were judged by the evaluation team to be sufficiently representative to support the estimation of required costs. Whenever possible, 90% confidence intervals are provided. The magnitude of these intervals suggest that the evaluation's cost estimates are "ball park" more than precise point estimates with small standard errors.[1/] However, the estimates presented at least are as soundly based as previous PSRO program cost estimates.[2/] Costs estimates were developed to:

[1/] Large confidence intervals are a problem endemic to cost estimation. The difficulty is not peculiar to these present studies.

[2/] While this study's cost estimates are generally higher than those of the Institute of Medicine (Assessing Quality in Health Care: An Evaluation, November 1976), conversation with Linda Demlo, the IOM PSRO evaluation project manager, suggests that the IOM figures were conservatively estimated.

(a) estimate selected unit costs;

(b) construct a series of national cost estimates;

(c) compare PSRO review costs with certain alternative forms of review (i.e., "Old UR" defined as the original UR regulations for hospitals and "New UR" defined as the revised utilization regulation of November 1974);

(d) determine the extent to which pre-PSRO review costs would be offset by the existence of PSRO review; and

(e) provide a basis for cost-benefit analysis (reported in section 7).

Summary statistics are presented below:

(a) Unit costs: The estimated total costs of PSRO delegated review (including MCE studies, review committee time, and administration) was computed at $11.20 (±.77) per discharge with estimated cost of donated physician time included. Estimated nondelegated concurrent review hospital cost per discharge are $8.99. The average PSRO level administrative costs per discharge is $7.11. Therefore, estimated total unit costs are $18.31 for delegated and $16.00 for nondelegated PSRO review. (These figures are computed on slightly different bases, in that delegated review invalues additional costs for a hospital UR committee and hospital based administration.)

(b) National PSRO cost estimates: The estimated costs of a fully implemented program of 100% review such as existed in 1976 would have been 268.5M for Federal beneficiaries and $689.9M, if all acute care hospital inpatients were included under PSRO review.[1/] These figures

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[1/] Data presented are midpoint estimates - an approximate 90% confidence interval for the $268.5 million estimate is ($220 million, $316.5 million) and for the $689.9 million estimate ($572 million, $806 millon). An approximate 90% confidence interval for the 81.3 million estimate is 67.5 million, $95 million). No meaningful confidence interval can be calculated for the estimates of "New UR" ($107.6M) due to the small sample underlying this estimate. The reader is thus cautioned that incremental "New UR" costs are "ball park" at best and presented merely for purposes of gross comparisons.

include estimates of currently donated physician time costed at $25/hour (the hourly wage associated with an annual income of $52,000; this figure does not include overhead and is thus an underestimate). The estimated costs of the targeted review which is current DHEW policy would have been $184M for 20% targeted review for the year 1976.

(c) Comparison to "Old" and "New" UR costs: One concept which the study has utilized is that of incremental costs.[1/] These costs are defined as the difference between the costs of a nationally implemented PSRO program (and associated review costs) and governmental costs which would have been incurred in the absence of a PSRO program. The costs can be determined given the two following assumptions about alternatives: (1) continued implementation of the original (pre-PSRO) utilization review regulations for hospitals; and (2) implementation of the November 1974 revised utilization review regulations. Since national estimates of the costs of review associated with the 1974 revised regulations are substantially higher than the original regulations ($107.6M vs. $81.3M), incremental costs of the PSRO program will vary depending upon assumptions. Assuming the continuance of the original regulations, the PSRO incremental costs for a 100% review program are estimated at $187.2M, and for a 20% targeted review program at $76.4M. The incremental cost estimate with respect to the revised UR regulation implementation is $161M for 100% review and $102.7M for 20% targeted review.

[1/] An assumption underlying "incremental" costs is that the true alternative is not PSRO vs. no review, but rather PSRO vs. some alternative organizational form of UR.

(d) Pre-PSRO review cost offsets: Cost offsets are defined as the extent to which pre-PSRO Medicare intermediary, Medicaid State agency, and State survey agency UR-related costs will be discontinued with the introduction of PSRO review. Experience to date indicates that the PSRO program is not offsetting UR-related expenditures in Medicare intermediaries and Medicaid State agencies to any significant degree. This is attributable to the fact that Medicare and Medicaid UR are only a small part of the claims processing systems employed to determine eligibility and coverage associated with individual claims. These claims processing systems are not destined to be replaced by PSRO activities and for all practical purposes represent fixed costs. To the extent that some UR-related expenditures are being offset, other new expenditures are being incurred which relate to liaison with the PSRO, and monitoring of PSRO review.

1.2.6 Cost-Benefit Analysis

The original intent of this evaluation was to estimate an aggregate cost-benefit ratio for the 18 active PSRO areas contained in the Medicare Utilization Rate Analysis. This purpose was frustrated because the Medicare analysis ultimately did not generate any aggregate PSRO-associated rate reductions. Given this finding, two approaches were taken. First, an aggregate "break-even" analysis was conducted and secondly, individual cost-benefit ratios were calculated for those PSROs that were associated with relative declines in Medicare utilization rates.

The "break even" concept as applied herein indicates the number of days "saved" (reduced days of care per 1,000) required to cover or "pay

back" the incremental costs associated with PSRO review. The value of days saved was estimated using HCFA data on audited charges. The algorithm used in effect, spreads part of the hospital routine services revenue lost from reduced Medicare utilization to non-Medicare patients and makes upper and lower bound assumptions concerning ancillary costs, i.e., either a zero percent or a fifty percent savings in ancillary service per diem is assumed. No attempt was made to value changes in quality, changes in product mix, or relocation of care to more appropriate sites, nor were long range reductions in spending (such as some reductions in the supply of hospital beds) considered.

Incremental costs were estimated from the hospital cost data described in section 6 and are defined as the sum of PSRO administrative costs for operation, the cost of amortizing start-up expenses over a 10-year period at 8%, and the excess of PSRO hospital CR costs over the costs of hospital UR for 1976 that were associated with Medicare review.

In aggregate, it was determined that if a 100% review PSRO program could achieve and maintain reductions in utilization rates on the order of 1.6% to 2.05% the program would pay for itself.[1/] While current aggregate utilization rate impacts appear to be below these levels, six of the seven PSROs that were associated with relative utilization reductions had benefit cost ratios greater than one. A focused review program would have lower expenditures than the 100% review mandated by DHEW policy in 1976. A twenty percent focused review program could have paid for itself if it had achieved and maintained reductions in utilization rates on the order of 0.65 to 0.83 percent.

Professional Standards Review Organizations' incremental costs equal about 0.98% of the estimated Medicare Part A reimbursements in the

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[1/] The relationship between days saved and other benefits is based on the fixed costs component of routine charges and allows for some savings to be related to averted ancillary charges.

eighteen PSRO areas studied. Each 1% reduction in the utilization rate beyond that required for breaking even produces a 0.5 to 0.6% decrease in Medicare Part A reimbursement expenditures.

This fact suggests that if in 1976 all PSRO's had achieved benefit cost ratios of 2:1, Medicare Part A expenditures would have been reduced by approximately 1%. But in order to achieve a 2:1 benefit cost ratio PSROs would have had to reduce utilization within the range of 3.2 to 4.1 percent.

1.3 Organization of the Executive Summary

The remainder of this volume serves as support material for the summary discussion of evaluation findings presented above in section 1.2. Section 2. provides the study context. The history of UR, the development of the PSRO law, the current status of the PSRO program, observations on program grantees and evaluation precedents are offered as historical perspective. Section 3 contains discussions of utilization impact studies: the Medicare data analysis, Hospital abstract data analysis, and the Colorado Case Study. The Medicare data analysis is presented in greater detail due to the significance of this particular study.

Section 4 details study findings on implementation of MCE policy, while Section 5 deals with secondary and non-quantifiable aspects of the PSRO program. Program costs are then explored in Section 6: UR cost components are detailed, incremental costs are defined, and estimates of costs of the PSRO program under differing operating assumptions are provided.

Section 7 follows with an elaboration of the evaluation's benefit-cost methodology. A display of disaggregated benefit-cost calculations is presented.

The Executive Summary is concluded with suggestions for future evaluation efforts, in section 8.

2. STUDY CONTEXT

The passage of the PSRO program was a major step in terms of its scope and potential implications. However, in terms of the basic mechanisms involved, PSRO was not new in that the principal components have been in use in various forms for some time. It is the purpose of this section to describe certain historical and environmental factors in order to provide a perspective within which to view the PSRO program and this evaluation. This will be done in a three-part presentation. The first section will discuss the background of utilization control activities and the development of the PSRO legislation. The second describes the PSRO program and its current implementation status. Finally, a section will attempt to relate previous review program evaluations to the current effort.

2.1 Historical Perspective

2.1.1 The Development of Utilization Review Mechanisms

As early as 1950, several hospitals had UR committees and several hospital discharge abstract services (e.g., PAS, HUP) provided summaries and comparative analyses for retrospective review. Utilization review efforts were also encouraged by some Blue Cross plans in the 1960's.

UR was required as a condition of participation by provider institutions in Medicare by the 1965 Social Security Amendments and in Medicaid by the 1967 Amendments. Federal regulations established standards for acceptable UR plans. In practice, the individual institutions' plans varied greatly in structure, operation, and effectiveness.

The Medical Care Foundation (MCF) concept emerged in the 1960's using a combination of professional standards review and claims review,

whereby physicians contracted to perform review for third-party payors. Various aspects of the MCF concept were eventually incorporated in the design of the PSRO program.

In 1970, anticipating the passage of the PSRO legislation with its massive technical and organization tasks, the National Center for Health Services Research and Development (NCHSR&D) established the Experimental Medical Care Review Organization (EMCRO) program "to develop [regionally-based] models which could test new approaches to the objective review of physicians' services." The basis of the program was the use of explicit diagnosis-specific admission, treatment, and overall patient management criteria.

2.1.2 The Development of the PSRO Law and the Interpretation of Its Objectives

The literature is generally in agreement that the PSRO legislation was prompted primarily by congressional concern with the increasing health care costs and Medicare/Medicaid program cost overruns.[1,2,3,4,5,6,7,8]

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[1] U.S. Congress, Senate, Committee on Finance, Medicare and Medicaid Hearings, 91st Congress, 1st session, 1969.

[2] U.S. Congress, Senate, Committee on Finance, Medicare and Medicaid: Problems, Issues, and Alternatives, Report of the Staff to the Committee on Finance, U.S. Senate, 91st Congress, 1st session.

[3] Bonnie Bullough, "The Medicare-Medicaid Amendments," American Journal of Nursing, LXXIII (November 1973), 1926-27.

[4] Herman Somers, "Health Care 1976: Costs and Consequences," Annals of Internal Medicine, LXXIV (February 1974), p. 211.

[5] Karen Levin and John H. Westerman, "P.L. 93-603 -- Impact of Teaching Hospitals," Hospital Medical Staff, III (February 1974), p. 1-2.

[6] Martin G. Dale, "PSRO: A Primer," Journal of the American Medical Association, CCXXIX (July 8, 1974), p. 158.

[7] Wallace F. Bennett, "The PSRO Amendment," Rhode Island Medical Journal, LVII (January 1974), p. 16.

[8] Robert J. Haggerty, "Quality Assurance: The Road to PSRO and Beyond," Pediatrics, LIV (July 1974), p. 91.

Congressional studies had found the Medicare/Medicaid UR mechanism to be ineffective as a financial control on the program. The 1972 Social Security Amendments which created PSRO sought to address the deficiencies in the existing cost control mechanism, UR, that had been identified by the Senate Finance Committee staff. There were some minor changes to control allowable charges for units of services by providers. However, major controls on the price components in the health care system were not possible within the scope of government regulatory control of Medicare/Medicaid. Instead, the major thrust of the cost control aspects of the amendment was in the form of utilization control.

Senator Wallace F. Bennett, of Utah, in introducing the PSRO amendment, stated that "without effective professional controls on utilization the costs of the program [Medicare/Medicaid] will continue to soar." He believed that the necessary control could not be achieved through the direct involvement of the Federal Government and that the principle of professional peer review should be maintained. As a result, the control of utilization was mandated through a physician peer review mechanism.

Havighurst and Blumstein examined the PSRO legislation to determine the intent of the program with regard to the relative emphasis of cost (utilization) control and quality control. They concluded:

> "...quality concerns are not prominent in the statute, a fact which clearly reveals Congress' primary interest in reducing utilization in hospitals and other facilities. Of course, it would have been unseemly for Congress to insist upon cost control without some regard for the quality of care provided, and therefore the inclusion of quality as a regulatory objective--though not an independent goal--might fairly be regarded less as a mandate to regulate quality than undue sacrifices of quality would not be made in the name of economy."1/

Professional Standards Review Organizations have become different things to different people. In the DHEW implementation of the program, the quality assurance aspects of the program were emphasized in order to gain the cooperation of physicians. On the other hand, the literature associated with the history of the legislation in Congress perceived a cost-containment orientation. This has tended to produce differing sets of views throughout the health care community regarding the program's objectives. These equivocal emphases and the lack of specified evaluation criteria tend to inhibit an evaluation of the program. However, an attempt was made to take both positions into account in appraising the program.

2.2 The PSRO Program: Current Status and Operations

2.2.1 The Current State of Development

2.2.1.1 Program Organization and Funding

The PSRO legislation mandated the establishment of the NPSRC to advise the Secretary of DHEW on the overall implementation of the program. The Council consists of eleven physicians of recognized standing in the appraisal of medical practice and has met bi-monthly since July 1973. The NPSRC makes recommendations on policy issues, provides

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1/ Clark C. Havighurst and James F. Blumstein, "Coping with Quality/Cost Trade-Offs in Medical Care: The Role of PSROs," Northwestern University Law Review, LXX, 6 (1975), p. 39.

technical assistance and information to PSROs, Support Centers, and Statewide Professional Standards Review Councils (SPSRC), develops regional norms used by PSROs, and assists in the evaluation of PSROs and Statewide Councils.

The law also required SPSRCs in States where there are three or more PSROs. The SPSRC is required to coordinate PSRO activities in the State, disseminate program information, and assist in evaluating PSROs' performances. The Councils are composed of physician representatives of the individual PSROs (one each), the State medical society (2) and the State hospital association (2) and consumer representatives (4). To date, six SPSRCs have contracted with DHEW (California, Connecticut, Maryland, Massachusetts, New York, and Pennsylvania), leaving twelve States yet to establish Councils.

Each Statewide Council and each PSRO in States without a Statewide Council are required to be advised and assisted by an Advisory Group. The group is to be composed of seven to eleven members representing non-physician health care practitioners, hospitals, and other health care facilities. These groups are generally in the early stages of development.

Thirteen Statewide PSRO Support Center contracts were awarded in the early development of the program. The primary purpose of the Support Centers was to provide technical and administrative assistance to the physician groups interested in obtaining PSRO planning or conditional contracts. As PSROs achieve conditional status, Federal funding of these Centers will be phased out. Nine Centers are still in operation at this time.

In 1972, the Secretary of DHEW designated the Office of the Assistant Secretary for Health as the administrator of the PSRO program. The Office of Professional Standards Review (OPSR) was established to handle the policy making and operational responsibilities of the program. In the summer of 1973, the Health Services Administration created the Bureau of Quality Assurance (BQA) to assume the quality assurance responsibilities. The OPSR and BQA cooperated to establish needed policies and to implement the PSRO activities. In the March 1977 reorganization of DHEW, the Health Care Financing Administration was created. The functions of BQA were assumed by the Health Standards and Quality Bureau (HSQB) and by the Office of Professional Standards Review.

The PSRO legislation provides that all costs of PSROs will be federally financed. Until fiscal year 1976, the cost of nondelegated PSRO review activities was funded through direct appropriations, and the cost of delegated hospital review activities was funded through hospital benefit payments. The 1975 Social Security Amendments provided for the financing of both delegated and nondelegated review activities from the Social Security Trust Funds. Management and non-hospital review costs continue to be financed through direct appropriation.

Total PSRO program funding was $4.48 million in F.Y. 1973, $32.85 million in F.Y. 1974, $36.21 million in F.Y. 1975, $47.65 million in F.Y. 1976 (the transitional quarter was funded at $11.98 million); F.Y. 1977 funding will approximate $102.13 million and F.Y. 1978 is estimated at $147.23 million.

2.2.1.2 Program Implementation

In early 1973, the Secretary published an initial set of PSRO area designations. After a period of public comment, a final set of area designations was made on March 18, 1974, covering the Nation. Twenty-eight States were designated as single PSRO areas, as were the District of Columbia, Puerto Rico, and the Virgin Islands. Guam, American Samoa, and the Trust Territory of the Pacific Islands were included under the Hawaii statewide PSRO. The remaining twenty-two States have from two to twenty-eight PSRO areas. The area designations for Minnesota and Texas are currently pending.

The PSRO legislation required the Secretary to enter into conditional agreements with qualified organizations before full designation as the PSRO for the area. However, due to varying degrees of review capabilities in different areas, it was necessary to provide funding for an additional preparatory step. Therefore, funding was awarded for planning organizations as well as conditional PSROs.

STATUS OF CONTRACTS IN THE PSRO AREAS[1/]

	7/74	7/75	7/76	3/77	8/77	10/78*
Planning	91	58	33	59	64	0
Conditional	11	63	87	108	108	183
Fully Designated	0	0	0	0	0	20
TOTAL	102	121	120	167	172	203
Unfunded Areas	101	82	83	36	31	0

*HSQB estimates based on present designation of PSRO areas.

[1/] U.S. DHEW, Health Care Financing Administration, PSRO Fact Book (Washington, D.C., U.S. Government Printing Office, 1977), p.9 and updated by HCFA personnel; herein after referred to as Fact Book.

PHYSICIAN MEMBERSHIP[1/]

DATE	NO. OF PHYSICIANS IN CONDITIONAL PSRO AREAS	NO. OF PHYSICIANS WHO ARE PSRO MEMBERS
6/74	27,000	13,000 (48%)
6/75	130,000	64,000 (49%)
FY 76	144,000	80,000 (55%)
FY 77*	238,000	133,000 (56%)
FY 78*	405,000	243,000 (60%)

*HSQB estimate

2.2.2 Program Activities

The focus of initial PSRO activities has been short-term hospital inpatient services. PSROs are required to develop a formal plan for this review within guidelines set by the law. To date, all PSROs have adapted the plan advocated by the former Bureau of Quality Assurance (BQA), now known as Health Standards and Quality Bureau (HSQB). The BQA model system is presented in the following table.

[1/] Fact Book, p. 13.

TYPES OF PSRO REVIEW ACTIVITIES 1/

	Purpose	Scope	Method	Timing	Personnel	Results
Concurrent Admission Certification	• Certify necessity of admission	All Title XVIII, XIX, & V patients	a. Diagnosis or problem specific criteria & standards b. Hospital level of care criteria & standards	Within 1st working day of admission	Review coordinator/ physician advisor	Admission certified or denied (authorizes or denies payment).
	• Assign checkpoint for continued stay review	All Title XVIII, XIX, & V patients	a. Diagnosis or problem specific norms, criteria and standards b. Hospital level of care norms, criteria and standards	Within first working day of admission. Usually performed in conjunction with certification of necessity of admission.	Review coordinator/ physician advisor	Certifies payment up to checkpoint
Continued Stay Review	• Review the need for continued hospital care	All Title XVIII, XIX & V patients still in hospital at checkpoint	a. Diagnosis or problem specific norms, criteria and standards b. Hospital level of care norms, criteria and standards	On or before day of checkpoint.	Review coordinator/ physician advisor	Extension granted, new checkpoint assigned, and payment certified up to new checkpoint or extension denied.
	• Assure that essential elements of care are being provided (concurrent quality assurance)	Sample of Title XVIII, XIX & V patients	Critical criteria and standards	Usually on or before checkpoint day in conjunction with review of need for continued hospital care	Review coordinator/ physician advisor	Improved compliance with PSRO quality criteria and standards.
Medical Care Evaluation Studies	• Assure quality of care and effective administration of health care services	1. Conducted on study basis 2. Sample size selected in relation to study topic 3. Study may be restricted to hospital or involve entire PSRO area depending on topic and hospital review delegation 4. Usually conducted on a retrospective basis	a. Classical feedback involving following steps: 1. Determine study objective 2. Establish criteria & standards 3. Design study 4. Data collection 5. Develop reports 6. Analyse results and identify deficiencies 7. Develop corrective plan—linkage with CME 8. Restudy	Usually of short duration (A week to a few months) At least one study under way at all times and four conducted per year	• PSRO/Hospital Criteria Committee • PSRO Hospital MCE or Medical Audit Committee • Health Record Analysts • Review Coordinators	• CME programs and administrative changes recommended to correct identified deficiencies • Criteria established for MCE's may be used in concurrent review or profile analysis • Findings can help focus concurrent review activity • Restudy determines whether deficiencies have been corrected
Profile Analysis	1. Identify areas where utilization practices may be inappropriate, focus concurrent review, and assist in topic selection for MCE studies 2. Monitor effectiveness of hospital review activities 3. Display local, regional and national norms of utilization	Aggregate statistical data on all hospital episodes of patients subject to PSRO review	Statistical trend analysis and comparative evaluation using data on hospitals in PSRO area and data from peer PSRO's	Periodic review (quarterly to annually, depending on nature of report and number of observations)	Health Data Analysts (in PSRO and hospitals) PSRO, Hospital Review Committees	• Priority subjects for MCE studies identified. • Priority conditions for in-depth admission certification and continued stay review identified • Impact of concurrent review on health services utilization

1/ Michael J. Goran, et al, "The PSRO Review System", Medical Care, XIII (April 1975, Supplement), p. 7.

* Has been changed to agree with JCAH standards.

PSROs have the option of performing pre-admission certification of elective admissions rather than concurrent admission certification within 24 hours of the admission. This mechanism was not found to be used to any significant extent. A notable exception is the CHAP program in Sacramento where all elective admissions are subject to pre-admission certification for a focused review on perceived problem areas. Some PSROs in Massachusetts perform pre-admission review of elective surgical cases.

Actual implementation of review activities in hospitals has progressed as follows:

IMPLEMENTATION OF REVIEW: HOSPITALS[1/]

DATE	NO. OF HOSPITALS IN CONDITIONAL PSRO AREAS	NO. OF HOSPITALS UNDER REVIEW
6/74	643	99 (15%)
6/75	2,013	362 (18%)
6/76	2,752	1,291 (47%)
4/77	3,432	3,044 (60%)
9/77	3,912*	3,400 (87%)
9/78	6,000**	4,500 (75%)*

*Estimate
**Approximate number of short-term non-Federal hospitals in the U.S.

IMPLEMENTATION OF REVIEW: DISCHARGES[2/]

DATE	NO. OF FEDERAL DISCHARGES IN CONDITIONAL PSRO AREAS	NO. OF FEDERAL DISCHARGES UNDER REVIEW
6/75	1,006,000	173,000 (17%)
6/76	4,498,000	1,240,000 (28%)
9/77*	6,870,000	4,700,000 (68%)
9/78*	14,800,000	8,600,000 (58%)

*HSQB estimate

[1/] Fact Book, p. 27.

[2/] Ibid., p. 28.

PSROs are required to delegate the actual review activities to provider institutions that show a desire and capability to perform that review satisfactorily. In the development of the program, some PSROs have predominately nondelegated hospitals while others have predominately fully delegated. The table that follows summarizes the delegation status of hospitals under review.

DELEGATION STATUS[1/]

DELEGATION STATUS	9/75	12/75	3/76	9/76	4/77
Fully Delegated	70 (19.3%)	205 (32.3%)	397 (46.1%)	834 (61.0%)	1,437 (70.3%)
Partially Delegated	44 (12.2%)	81 (12.7%)	106 (12.3%)	128 (9.3%)	125 (6.1%)
Non-Delegated	248 (68.5%)	349 (55.0%)	359 (41.6%)	406 (29.7%)	482 (23.6%)
TOTAL HOSPITALS UNDER REVIEW	362	635	862	1,368	2,044

At present, there are no aggregate data regarding the number of initial denials by PSROs or their delegated reviewers. Nor are there data regarding reconsiderations, hearings or appeals. To date, the sanction power in the PSRO legislation, whereby fines and suspensions from the program may be imposed, has not been utilized.

Profile analysis explicitly mentioned by the law, is only now being developed. The slow implementation of profile analysis has been due to difficulty in contracting for establishing the necessary computerized data systems. The PSRO Management Information System (PMIS) is still in the early stages of implementation. Data to be generated from this system

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[1/] Fact Book, p. 30.

(most importantly the PHDDS component) are needed to support nationwide profile analysis activities and to serve as a basis for focusing concurrent review and defining topics for medical care evaluation studies.[1/] It is critical that specific diagnostic areas for which concurrent review would have maximum payoff be isolated. Lack of data inhibits the potential for PSROs to focus review upon empirically determined problem areas. Ideally, profile analysis will be able to focus CR and MCE activities on these problem areas, help to evaluate review activitiy effectiveness, and develop local utilization norms.

MCE development lags behind the implementation of CR in the individual PSROs by approximately one year. Until January 1977, guidelines for MCEs were general. BQA Transmittal Number 43 greatly clarified the guidelines, describing the essentials of MCE studies, the PSRO-hospital relationships, and the number of MCEs required. The Transmittal also clarified differences between Joint Commission on Accreditation of Hospitals' requirements and PSRO requirements. The extent of MCE implementation is discussed extensively in section 6.

While PSROs have focused initially on short-term hospital inpatient services, they are required eventually to review all institutional services. In October 1976, fifteen Conditional PSROs were selected to perform two-year demonstration projects in long-term care review. Of the fifteen, all but two are currently performing such review. In addition to the demonstration projects, there are five other PSROs performing long-term care review. HSQB expects to fund an additional twenty demonstration projects in the near future. Five demonstration projects in ambulatory care review have been funded with five more expected in the coming year.

[1/] PHDDS = PSRO Hospital Discharge Data Set, collected on each discharge.

2.2.3 Case Studies

The previous subsection of this report described the current status of PSRO implementation. This subsection provides an overview of how conditional PSROs actually operate. Much of the material required for this process description was derived from a series of case study visits to selected PSROs around the country. These areas included: Mississippi, Baltimore, Sacramento, Milwaukee, Flint, and South Carolina.[1/] These case studies represent a reasonable cross section of PSRO operating models; e.g., statewide versus small area, full delegation of hospitals versus total nondelegation of hospitals, mature data systems versus no operational data systems, and use of explicit review criteria versus implicit review criteria.

Operating Responsibilities: PSROs are required to develop criteria and standards and select norms for each type of review which they perform. For review in short-stay general hospitals, the PSROs are required, at a minimum, to perform admission certification concurrent with a patient's admissions, continued stay review, and medical care evaluation studies.[2/] As soon as the required data systems are implemented to develop profiles of provider and physician patterns of care, the PSRO will be required to review these data.

Once a quarter, the PSRO, normally through a data processing subcontractor, is required to report to the national level certain statistics

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[1/] An additional case study of the Colorado PSRO was performed using a lengthier and somewhat different protocol than applied to those listed. The findings derived from this case study, with respect to the process used for concurrent review are generally consistent with those presented in this section. These findings are presented in a separate section.

[2/] Practically speaking, this amounts to certification within the first 48 hours of the episode.

involving number of reviews, patient review and disposition results of MCE studies, and operating costs. A large proportion of conditional PSROs now conform to most of the above operating responsibilities but with varying degrees of sophistication.

Organizational Models: The essential requirements an organization must meet in order to quality as a PSRO are set forth in Section 1150 of the Social Security Act. In general, the organization must be a nonprofit professional association composed of licensed physicians and include as its membership a substantial proportion of all licensed physicians practicing in the area. Exhibit 2.1, below, contains selected organizational characteristics of PSROs included in the case studies. Two of the six are statewide PSROs, primarily rural; the remaining four are local having various urban-rural compositions. The populations vary from 580,000 for the Flint PSRO to 2.7 million for South Carolina. Although medical foundations are the most prevalent sponsoring organizations, one PSRO is sponsored by a medical association and one by a private, nonprofit physician group organized specifically for PSRO sponsorship. Physician membership in these PSROs varies from 55 to 72 percent of the physicians licensed and practicing in the area; the national average is around 60 percent.

Each PSRO has a governing body elected from among its membership. In the case study PSROs, board membership varied from 12-23 members. Committees of the board are formed for special tasks such as professional practices, hospital liaison, criteria development, data policy, membership,

Exhibit 2.1

PSRO Service Areas and Organizational Characteristics

PSRO	Area Served	Sponsor	Percent Physician Membership	Governing Body and Committees	Total Staff of PSRO (FTEs)	Conditional Status Date
Milwaukee Foundation for Medical Care Evaluation (MFMCE); Milwaukee, Wisconsin	Seven county area of Southeast Wisconsin; population urban 1.7 million	Medical Foundation	55%	21 Board members 16 Formal Committees	16	July, 1975
Professional Review Organization - Genesee, Lapeer, and Shiawassee Counties (PRO-GLSC); Flint, Michigan	Three county area of Michigan; urban-rural mix; population 580,000	Medical Foundation	66%	14 Board members 5 Formal Committees	20.5	June, 1975
Baltimore City Professional Standards Review Organization (BCPSRO); Baltimore, Maryland	Baltimore city; urban; population 845,000	Medical Foundation	72%	34 Board members 6 Formal Committees	15	June, 1975
Mississippi Foundation for Medical Care (MFMC); Jackson, Mississippi	Statewide; rural-urban mix; population 2.3 million	State Medical Association	67%	23 Board members 10 Formal Committees	73.3	August, 1975
Greater Sacramento Professional Standards Review Organization (GSPSRO); Sacramento, California	Five county area; urban-rural; population 1.0 million	Non-profit Corporation	65%	18 Board members 13 Formal Committees	8.0 plus 35.0 under contract to Sacr. MCF	April, 1975
South Carolina Medical Care Foundation (SCMCF); Columbia, South Carolina	Statewide; rural-urban mix; population 2.7 million	Medical Foundation	85%	12 Board members 5 Formal Committees	47.7	June, 1975

financial management, and other administrative areas. The number of formal committees varies among PSROs according to need. PSRO staffing levels vary, depending primarily upon delegation status of hospitals; i.e., employment of review coordinators.[1/] All of the PSROs chose had advanced to conditional status in mid-1975.

While each PSRO must conform to basic legal and organizational requirements of the law and Federal regulation, there is ample room for diversity according to local priorities, funding levels, and operating models. Exhibit 2.2, following this page, presents a typical PSRO organizational chart. Typical organizational functions include hospital review, data collection and analysis, MCE studies, and various administrative activities. Often the Executive Director also serves as the Medical Director in small PSROs. Most of the professional staff are assigned to the hospital review function; i.e., review coordinators and their supervisors. The size of the PSRO's staff depends on whether review is delegated to hospitals. There is probably no "typical PSRO" in that each is unique after basic Federal requirements are satisfied.

Concurrent Review (CR) Responsibilities: There is considerable flexibility in the scope, extent, location and conduct of required concurrent review procedures. For example, among the case studies, Milwaukee, Mississippi, and Baltimore delegate the majority of their concurrent review to the hospitals while Sacramento is totally nondelegated. Flint

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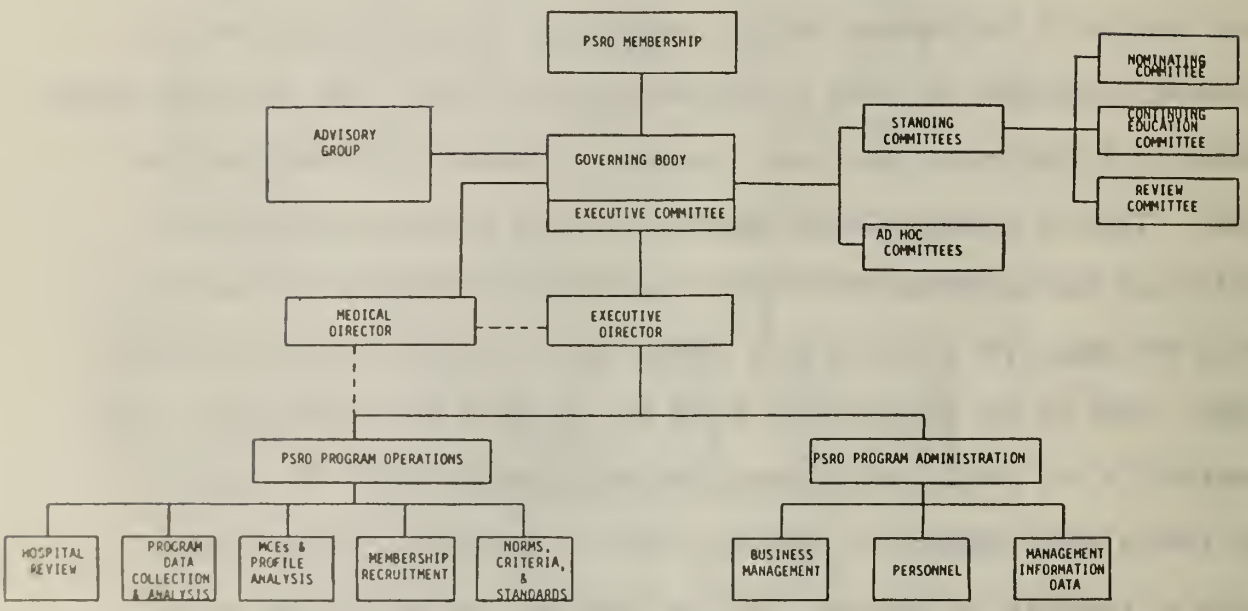
[1/] Ordinarily the review coordinator(s) in a delegated hospital are on the hospital payroll. Review in nondelegated hospitals is performed by PSRO employees.

Exhibit 2.2

TYPICAL PSRO ORGANIZATIONAL CHART[1/]



1/USDHEW, Health Care Financing Administration, PSRO Fact Book, p. 16.

and South Carolina also maintain a partial-delegation status for hospitals. Although most of the PSROs utilize a form of explicit review criteria, some such as Sacramento have none and leave such criteria implicit, depending heavily on the reviewer's judgment and experience. Most PSROs do not begin review until the patient is admitted; only the Sacramento PSRO has a pre-admission certification requirement for all elective admissions.

Review is typically conducted by a team consisting of a physician advisor and review coordinator(s). In some PSROs, physician advisors play an active role in the review process and are stringent regarding admissions and lengths of stay; others tend to be more conciliatory to the attending physician. Most PSROs utilize regional PAS diagnostic-specific length of stay norms to initially certify lengths of stay, although others, such as Sacramento, use their own historical norms. Review coordinators are normally experienced nurses trained at the R.N. level, former medical records administrators, or experienced hospital-based social workers. PSROs differ widely with respect to the professional backgrounds of their review staffs. Milwaukee uses a mix of nurse, medical record and social work skills. Others such as Sacramento will utilize only R.N.s as review coordinators. Relationships with attending physicians also vary; for example, review coordinators in Sacramento and Milwaukee interact with attending physicians on a regular basis. In Flint and Mississippi they do not, and all necessary contacts with the attending physician are made by the physician advisor. It is possible that these variations could account for the extent to which a PSRO has an effective concurrent review process.

Medical Care Evaluation Studies (MCE): MCE efforts vary. Other than compliance with minimal JCAH medical audit requirements, most hospitals in the observed PSRO areas still do not engage in substantive MCEs that result in changes in medical or administrative practices. This is particularly true in smaller hospitals. While Milwaukee, South Carolina and Baltimore City PSROs have been active in stimulating MCEs, little concrete evidence of improvements in quality of care exists at this time. South Carolina has been active in efforts to implement area-wide MCEs.[1/] Other PSROs are just beginning to address MCE implementation and some have not conducted any. Certain PSROs employ MCE coordinators to monitor and assist hospitals.

Monitoring and Data Collection: PSROs have a responsibility to monitor regularly the conduct of delegated review and MCE studies and to collect and process statistics related to each. Examination of the case study PSROs indicates that more diversity exists in this area than any other. Milwaukee, Mississippi, and South Carolina maintain strong monitoring and data collection systems while Baltimore, Flint, and Sacramento do not. A few PSROs not only collect all PHDDS data elements, but are routinely profiling such data on a diagnosis, hospital and physician basis; such reports are used in conferring with area hospitals and physicians

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[1/] The epidemiological potential of statewide MCEs was demonstrated by a recent South Carolina area MCE. The PSRO discovered by profile analysis that cataracts were five times as prevalent in South Carolina Federal patients as in the U.S. in general. The diagnoses were verified by a records sample, and a study of the work histories of affected patients is now being planned as a cooperative effort by several South Carolina health organizations.

to identify reasons for variances from norms.[1/] Staff at the Milwaukee PSRO believe that the use of data is the most powerful tool available to a PSRO. Sacramento, in contrast, places its emphasis upon the concurrent process, per se (particularly admission certification). Data systems in Sacramento, as well as in Flint and Baltimore, are in various stages of development.

Summary: In summary, while the basic intent of the law is being carried out, the PSRO process varies widely depending upon pre-PSRO events, local preferences, funding levels, and priorities. This overview of the range of PSRO organization and process based upon an analysis of six case studies presents a picture of great diversity. Analysis of the case studies leaves the impression that each PSRO is unique due to its response to factors which are specific to its own particular operating environments and its local physician constituency.

2.3 Evaluation Precedents

The review programs that preceded PSRO were, to a considerable extent, local efforts designed to meet specific perceived needs. The evaluations of these programs were often performed to assist in individual programmatic functions such as program planning and justification for continued funding. As a result, the evaluations were not designed to make forecasts about the widescale effectiveness of a particular review mechanism. Given the diversity of the purposes of the programs, the evaluations' functions, data limitations, and the state-of-the-art of program evaluation, generalizations about review programs from prior evaluation efforts would be unfounded. Nevertheless, the results of previous evaluation efforts are summarized here in order to provide some context for the design and results of the OPEL

[1/] PSRO Hospital Discharge Data Survey, a defined data set collected in each patient discharged.

evaluation. The predecessor evaluation efforts are of some interest and relevance to this evaluation since PSRO incorporates features of many previous local UR programs.

2.3.1 Categorization Scheme

The various review programs aimed at utilization control do not lend themselves to a convenient classification since each presents a unique combination of characteristics. For the purposes of this presentation, the programs are classified according to the timing of the review mechanism and the purposes of the program. The following table shows these categories and the various review programs in each category.

PURPOSE	TIME OF REVIEW		
	Prospective and Concurrent (before admission and during the hospitalization)	Concurrent (during the hospitalization)	Retrospective (after discharge)
Utilization (necessity and duration of care	CHAP HAPP HASP	OSCHUR CONSERVE CAP PDUR S.C. PRSO BX of SW Ohio Genessee	Traditional Utilization Review
Quality of Care		PIPSRO	UPRO Georgia EMCRO Mississippi EMCRO

CHAP - Certified Hospital Admissions Program (Sacramento, California)
HAPP - Hospital Admissions Precertification Program (New Mexico)
HASP - Hospital Admissions and Surveillance Program (Illinois)
OSCHUR - On Site Concurernt Hospital Utilization Review (Utah)
CONSERVE - Concurrent On Site Evaluation and Review Effort (Multnomah/ Portland, Oregon)
CAP - Colorado Admissions Program (Colorado)
PDRU - Pre-Discharge Utilization Review (Pennsylvania)
SCPSRO - South Carolina Statewide PSRO
BX of SW Ohio - Blue Cross of Southwest Ohio
Genessee - Genessee Medical Corporation (Flint, Michigan)
PIPSRO - Private Initiative in PSRO
UPRO - Utah Professional Review Organization

2.3.2 The Results of Previous Evaluation Efforts[1/]

Generally speaking, the evaluations performed on programs that review utilization for necessity and duration of acute care have been inconclusive. Only one program (CHAP, Sacramento) has demonstrated a significant reduction in measures of utilization. Evaluations of other programs either found no significant effect, were met with serious challenges as to their evaluation methodology, or were of such limited scope as to cast doubt on their value. Another program evaluation (HAPP, New Mexico) indicated a significant increase in total hospital days and expenditures per Medicaid eligible.[2/]

The evaluation efforts relied heavily on length of stay analyses. These analyses were of questionable value for two reasons: (1) a nationwide trend of decreasing lengths of stay in this period was not adequately considered, and (2) average length of stay is not a useful measure of overall utilization unless combined with admissions rate data to obtain days of care rate data for some well-defined population.

The evaluations that found a decrease in average length of stay (ALOS) noted this decrease to be approximately one day or roughly ten percent. In two instances, CHAP and CAP, when the rate of days of care was estimated, a similar decrease was found. Only a few studies had more than

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[1/] All available, relevant peer review evaluation efforts were reviewed for this section. Ideally, these studies would be listed, described, and discussed in some detail. However, due to the need for conciseness in this Executive Summary, they can only be referred to in general terms. Volume II of this report presents a detailed discussion of these previous evaluation efforts and provides appropriate references.

[2/] This study did find an impact on the use of injections. This finding implies that PSROs can effect change if the focus is carefully selected.

one year of review data. However, where these data were available, ALOS was observed to remain stable after the initial year's decrease. This observation suggests a diminishing return function for a continued stay review program. Certain studies that found no significant decreases in utilization did find a relationship with hospital occupancy; where occupancy was high, review was the most effective. In areas where ALOS was already quite low, little evidence of effectiveness was found, possibly indicating a lower proportion of unnecessary utilization initially.

The few cost-benefit studies that were performed indicated a marginally favorable return on investments, but these studies frequently did not properly account for the effect of fixed costs on the value of decreased utilization. Since a considerable portion of the cost of a hospital day is fixed, when a day is saved through UR, the value of the day saved is overstated if valued at the per diem rate, in that fixed costs are subsequently redistributed to the remaining patient days. Per unit prices (per diem rates) then increase. Thus, much of the apparent savings are shifted to the charges associated with future patient days.

Less information is available regarding the outcomes of quality of care oriented review programs. Limited studies of the Georgia and Mississippi EMCROs indicated significantly greater physician compliance with locally developed quality of care criteria. However, the scope of these studies was quite limited. No effect on ALOS or indicators for admissions was found. The Utah Professional Review Organization found no demonstrable impact on physician performance. The New Mexico EMCRO (HAPP), was found to significantly decrease the use of injectables only.

In reviewing the overall effectiveness of eighteen quality assessment programs, an Institute of Medicine (IOM) panel concluded that existing evaluation information does not substantiate the effectiveness of either Medical Care Evaluation studies or Concurrent Review. While some individual instances of improvement in quality and changes in utilization were observed, the overall effectiveness of the programs in implementing change was felt to be doubtful. The IOM study hypothesized that eventual general improvement in the quality of medical practice might result due to stimulation of increased interest in quality assurance. It was further felt that the limited availability of data had inhibited carefully designed evaluations of the programs.

2.3.3 The OPEL Evaluation

The OPEL evaluation, while still subject to certain limitations, overcame some of the problems experienced by early evaluation efforts with respect to scope, data sources, study periods, matched comparison groups and cost studies. While the OPEL evaluation study emphasizes two utilization studies, the Medicare Rate Analysis and the Hospital Discharge Abstract Study, the Medicare Rate Analysis sample areas were also used to define sample frames for the evaluation's cost and case studies. This sampling strategy was followed for the cost data because the Medicare utilization data allowed for the calculation of rates and hence areawide benefits. Such population-based utilization rates were necessary to support cost-benefit analysis at the PSRO level.

A total of eighteen active areas were identified for the analysis of the Medicare rate data. These areas, taken as a group, represented a

limited universe for which review costs and benefits were compared. A subset of six of these eighteen areas were also selected for indepth case study analysis.[1/] Field trips to each of the case study areas were made to collect detailed information concerning the nature of the PSRO review process, the developmental history of the PSRO, and a wide variety of environmental and local health system factors that could impinge upon hospital utilization in these areas. This information, in turn, was used to explain the relative influence of PSRO review upon hospital utilization vis-a-vis other potential causal factors.

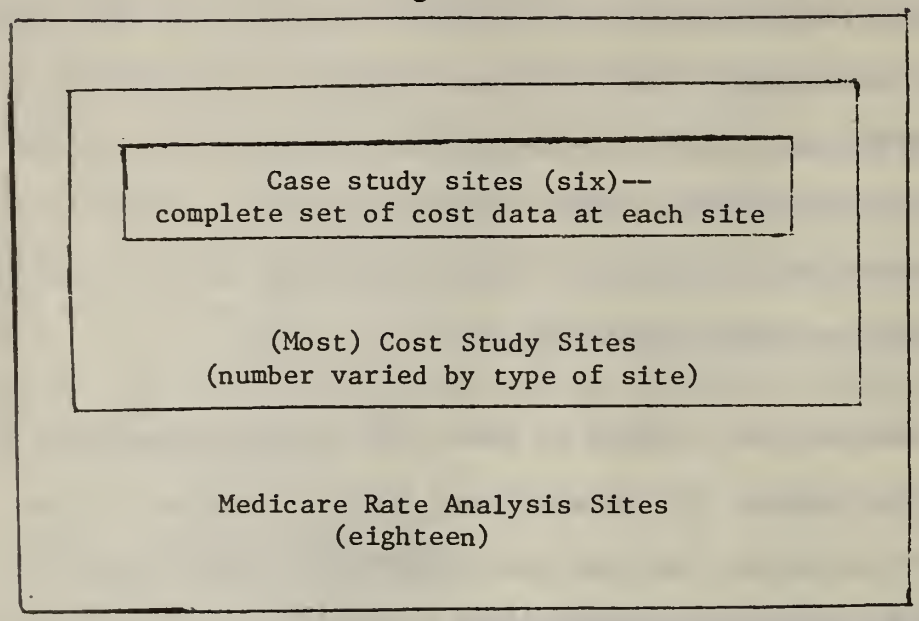
To increase the validity of these cost-benefit comparisons, case study sites were chosen, for the most part, from the eighteen active areas referred to above. Further, cost study sites were selected such that data from each of those studies were available for all the case study PSRO areas.

Some exceptions to this general principle were made to maintain a reasonably even distribution of cost study sites across the Nation. In addition, with respect to the selection of Medicare intermediary and Medicaid State agency sites, emphasis was placed upon choosing those with relatively high claims volume. These factors were taken into account in order to provide gross estimates of <u>national</u> costs of each of the review processes studied, considered independently from the limited cost-benefit approach outlined above.

[1/] An additional special study was made of the Colorado PSRO.

Figure 2.3, below, depicts the relationships of these various sites.[1/]

Figure 2.3


Case study sites (six)--
complete set of cost data at each site
(Most) Cost Study Sites
(number varied by type of site)
Medicare Rate Analysis Sites
(eighteen)

[1/] The Hospital Discharge Abstract study sample was constrained by locations of PSRO hospitals subscribing to the participant abstract services. Therefore, the two sampling strategies were of necessity unrelated. In any case, the hospital discharge data analysis could not be utilized in the cost-benefit analysis. The discharge data was available only in a scattered geographic distribution which made the calculation of areawide use rates impossible. These rates are necessary for cost-benefit analysis.

3. UTILIZATION STUDIES

3.1 Introduction

The evaluation of PSRO effects on hospital utilization was intended to determine whether PSROs, through concurrent review of medical necessity and the appropriateness of level of care have:

(a) affected patterns of hospital use;

(b) reduced the volume of hospital utilization, standardized for size of eligible Federal populations, and

(c) shown a potential to moderate the rapid rate of increase in Federal health care expenditures.

The evaluation examined several measures of utilization. These included days of hospital care utilized per 1,000 population, admissions (or discharges) per 1,000 population, average length of stay (ALOS), proportions of patients with long stays, and case mix indicators.

The PSRO program impact on hospital days of care per 1,000 (also referred to as the "utilization rate") is, technically speaking, the only adequate aggregate indicator of the program's utilization effect and the only indicator with a direct functional relationship to expenditures. This is attributable to the fact that the utilization rate is a measure of the total volume of hospital use per unit population in a geographic area and shows the combined effect of changes in both the ALOS and the admission (or discharge) rate per 1,000.[1/] Taken alone, neither ALOS nor the

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[1/] ALOS and the discharge rate are related to the utilization rate by the equation Days of Care per 1,000 = Discharges per 1,000*ALOS.

admission rate conveys conclusive information on the volume of hospital use. Rather, they give indications of hospital use patterns (as do such measures as percentage of long stays and case mix indicators). As such, they give rise to inferences regarding PSRO effects on the appropriate use of hospitals.

While PSRO-induced reductions in aggregate use of hospitals would imply movement toward goals of increased appropriateness and cost-containment it would be incorrect to assume, conversely, that increases in utilization rates signal a higher level of inappropriate care. Hypothetically, correction of underutilization by PSROs could cause increases in utilization rates. Since an operational definition of appropriate care is currently unavailable, it was not possible to compute a true measure of either over- or under-utilization in the studies conducted in this evaluation. Therefore, inferences from the studies regarding PSRO effects on the appropriateness of care are, at best, tentative.[1/] Specifically, inferences depend heavily on the assumption that decreased utilization is not associated with inappropriate care.

Three studies of PSRO impact on utilization were conducted for this evaluation.[2/] Two of these examined differential changes in hospital utilization rates (days and admissions per 1,000 eligibles) and ALOS associated with the introduction of PSRO review versus pre-PSRO hospital

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[1/] It should be noted that none of these utilization measures are true measures of the appropriateness of hospital utilization per se. The appropriateness and medical necessity of hospitalization cannot be directly measured from aggregate utilization data. The appropriateness and necessity of hospitalization can only be evaluated on an individual case basis in the context of expert clinical judgments of the particulars of the case, such as the diagnostic process, the signs and symptoms, the laboratory test values, etc.

[2/] While the case studies reported on elsewhere also analyzed utilization effects they primarily addressed process and contextual issues.

based utilization review. One of these studies, the Medicare rate analysis, focused on the effects of implementing binding PSRO review in each of 18 active PSRO areas and in the 18 areas combined. The other rate study, an extensive local case study of a relatively mature PSRO, examined the effects on total and diagnosis-specific utilization for both Medicare and Medicaid in the State of Colorado in the first two years following the start of binding review. A third study, based on hospital discharge abstracts, examined PSRO effects on length of stay and case mix, but not population-based use rates, in hospitals across the country.

In each study, PSRO is considered to be the "experimental treatment," while utilization review as conducted by hospitals and fiscal intermediaries is the "comparison treatment." While it would have been informative, it was not feasible in the present evaluation to measure PSRO CR effects relative to different specific forms of hospital-based utilization review. Although initiation of hospital-based CR (upon which PSRO CR is modeled) is known to have occurred in some larger hospitals in 1976, wide variation among hospitals in review models used and intensity of implementation in nonactive PSRO areas would have precluded the calculation and subsequent analysis of utilization rates. The PSRO is a unique treatment variable because PSRO as an operational organizational entity differs conceptually and organizationally from other forms of utilization review.

As explained in section 1.1, PSROs are structured, physician-sponsored organizations specifically responsible for implementing the process of binding CR, MCE studies, and profile analysis. This process normally encompasses the use of uniform criteria, norms and standards on an areawide

basis. The PSROs also receive considerable assistance and direction from the Federal Government in the form of frequent transmittals, expert technical assistance, and periodic assessment. In contrast, in a non-PSRO environment, hospitals and fiscal intermediaries have received only minimal guidance, assistance, and monitoring of their utilization review activity. Criteria, norms, and standards (if used) would be selected on a hospital-by-hospital basis; hence, their uniformity, on an areawide basis, could not be assured. Hospital review decisions are advisory with respect to fiscal intermediary reimbursement and retrospective denials of payment by fiscal intermediaries are permitted.

3.2 The Medicare Utilization Study

3.2.1 Introduction

This subsection describes the Medicare data base analysis. A rather complete development of this study is provided. The study analyzed utilization rates across numerous PSRO "treatment" and "comparison" areas. For this and other reasons detailed in section 1.1 above, this study is the most comprehensive analysis of the impact of the PSRO program on hospital utilization to date.

3.2.2 Study Methods

3.2.2.1 Data Sources

Data for this study were extracted from the following data bases maintained on a continuing basis by the Social Security Administration: (1) Medicare Enrollment File (counts of enrollees); (2) Query File (counts of acute care hospital admissions); and (3) the Billing File (length of stay, discharge counts, and days of care). The PSRO area characteristics were

obtained from the Area Resource File maintained by the Bureau of Health Manpower, HRA. The SSA data were tabulated (by SSA personnel) from magnetic tapes of unit records and delivered to the OPEL evaluation team, aggregated at the level of PSRO areas, and stripped of all patient and provider identifiers. The following variables were obtained for each PSRO:

Dependent (program impact variables)

(1) live discharges/1,000 - first half of year for 1976
(2) live discharges/1,000 - second half of year for 1976
(3) live days of care/1,000 - first half of year for 1976
(4) live days of care/1,000 - second half of year for 1976
(5) total days of care/1,000 - first half of year for 1976
(6) total days of care/1,000 - second half of year for 1976
(7) length of stay (live discharges) - first half of year for 1976
(8) length of stay (live discharges) - second half of year for 1976
(9) length of stay (total discharges) - first half of year for 1976
(10) length of stay (total discharges) - second half of year for 1976
(11) admission/1,000 - first half of year for 1976
(12) admission/1,000 - second half of year for 1976

Independent (explanatory variables)

(13-24) 1974 values of variables one through twelve (used as an adjustment for variation in baseline data)1/
(25) population density
(26) hospital bed occupancy rates, calculated as an average for all the PSRO hospitals, weighted by bed size
(27) Percent families with income under $5,000
(28) hospital beds per 100,000
(29) percent discharges under PSRO review, by quarter or age of PSRO in months
(30) an indicator for presence or absence of CR experience with Medicaid patients prior to the beginning of the PSRO program (PSROs with prior experience in Medicare review were excluded from the study)

In calculating the various dependent variables, numerators were generated from data gathered on hospitals in each PSRO area, while denominators represent the Medicare-enrollee populations residing in the same PSRO area. It is clear that numerators and denominators are not strictly comparable;

1/ 1975 data were not used as this was a transition year, i.e., neither a "baseline" year or a "treatment" year.

people move across PSRO boundaries, whether permanently, seasonally, or as a result of physician hospital admitting practices. PSRO areas do not necessarily correspond to medical service areas, and some of them experience a considerable net inflow or outflow of patients, particularly metropolitan or resort areas. We regard the calculated rates as valid indicators of Medicare utilization, however, for three reasons:

(a) Patient migration is a relatively constant factor,

(b) Those areas which experienced marked seasonal or secular variation in enrollees were not included in the study, and

(c) Although absolute rates cannot be drawn, given the relative stability of the migration factor, comparisons of rates over time and of changes in rates from one area to another can be made.

3.2.2.2 Study PSRO Area Selection

As has been explained previously, the selection of active PSRO areas to be included in the study was constrained by the newness of the PSRO program. Of the 203 designated PSRO areas, only 24 had at least 50 percent of Medicare discharges covered by binding CR by the first quarter of 1976. Of these, two were eliminated because they had pre-PSRO Medicare program experience (e.g., SSA demonstration sites). The few instances of PSROs with early CR under the Medicaid program were retained in the sample, since there were no clear indication that these activities had any significant "spill-over" effect on the Medicare review process. The results of the study team's statistical tests for relationships between the Medicaid review indicator (variable 30 above) and PSRO utilization changes were

nonsignificant for all of the utilization measured listed. These results are consistent with other studies of the early Medicaid program CR.[1/]

For each of the selected active PSRO areas, comparison areas of nonactive PSROs were selected, matching on the following variable categories: geographic region, demographic characteristics, and characteristics of the PSRO's health care delivery system. The matching was done prior to constructing the Medicare data base. After the data base was constructed, measures of mismatching were computed and a few sites with unacceptable mismatch were dropped.

The average baseline percent difference between active PSROs and their matched comparison PSROs for the groups finally selected is shown in Table 3-1 for each census region and overall.

[1/] Brook, R.A., "Controlling the Use and Cost of Medical Services: The New Mexico Experimental Medical Care Review Organization: A Four-Year Study"

TABLE 3.1

Active PSROs by Census Region
Average Regional Mismatch of Active PSROs with
Comparison PSROs (% difference)

First Half 1974 Data

Region	Total Discharges/1000	Total Days of Care/1000	Live Discharges/1000	Live Days of Care/1000	Average LOS
West N=8	-0.6%	1.4%	-0.7%	-5.7%	-1.2%
South N=4	-1.3	-3.5	-0.8	-4.8	-1.6
North Central N=5	1.4	10.1	1.5	10.2	8.6
Northeast N=1	13.6	1.6	13.8	3.8	-12.4
Total N=18	0.8	-0.3	5.0	-0.8	0.9

TABLE 3.2

Percent of Regional Mismatch of NCHS "over 65"
Data for 1974, with PSRO Medicare Data

	ALOS	Days of Care 1000	Discharges/ 1000
West	-1.9%	-2.0%	-24.5%
South	-13.7	-3.0	+20.1
North Central	-8.3	-18.0	+11.8
Northeast	+2.4	-34.7	+12.0
Total	+1.3	-16.6	+14.9

This table indicates the degree to which comparison and active PSROs were matched for a given variable. Regional variation is presented. Larger numbers (+ or -) represent lesser degrees of match. Negative signs indicate the active areas were below their comparison areas, positive signs the opposite. Thus for "total discharges" in the West the comparison areas were on average only .6% different from their matched areas. The total column indicates the overall degree to which comparison areas were matched to active PSROs.

Table 3.2 indicates the degree to which combined active and comparison PSRO area data are representative of the National Center for Health Statistics estimated regional utilization rates for the over 65 age population. Except for the southern census region the match on average length of stay is very close. The Medicare average length of stay of the 54 PSRO areas is only 1.3% higher than that estimated for the total U.S. over 65 population by NCHS. For total days of care/1,000 and for discharges/1,000 the Medicare rates in the PSRO study areas are about 15% lower than the estimated NCHS rates for the over 65 population. This may be due to the fact that the PSRO study areas are less urbanized than the regions as a whole. While these comparisons indicate that the PSRO areas are not sufficiently representative of some regional utilization patterns for use in accurate national extrapolations, that was not the primary intent of the analysis.

TABLE 3.3

Percent of Medicare Discharges Under Binding Review
As of July 1, 1976 and October 1, 1976

PSRO	July 1, 1976	October 1, 1976
Active Area A	99.9	99.9
Comparison Area A1	0	0
Active Area B	92.1	99.6
Comparison Area B1	0	0
Comparison Area B2	0	0
Active Area C	100	100
Comparison Area C1	0	0
Comparison Area C2	0	2.5
Active Area D	99.8	99.8
Comparison Area D1	0	0
Active Area E	99.9	99.9
Comparison Area E1	0	0
Active Area F	70	80
Comparison Area F1	0	0
Active Area G	100	100
Comparison Area G1	0	0
Comparison Area G2	0	0
Active Area H	96.7	97.1
Comparison Area H1	0	0
Comparison Area H2	0	0
Active Area I	57.7	66.5
Comparison Area I1	0	0
Active Area J	99.8	99.9
Comparison Area J1	0	3.5
Active Area K	77.1	79.5
Comparison Area K1	0	0
Comparison Area K2	0	0
Active Area L	100	100
Comparison Area L1	0	0
Active Area M	99.8	99.8
Comparison Area M1	11.2	24.9

Percent of Medicare Discharges Under Binding Review (continued)

PSRO	July 1, 1976	October 1, 1976
Active Area N	99.6	99.6
Comparison Area N1	0	0
Active Area O	98	100
Comparison Area O1	0	0
Comparison Area O2	0	0
Active Area P	96.8	99.9
Comparison Area P1	0	0
Comparison Area P2	0	0
Active Area Q	89.1	94.1
Comparison Area Q1	0	0
Active Area R	58.3	81.2
Comparison Area R1	0	0
Comparison Area R2	0	0

Source: Office of Research and Statistics, HCFA, DHEW.

Table 3.3 indicates the degree to which PSRO active areas were conducting PSRO review compared to their comparison areas. Active areas should contain a high degree of review; while comparison areas preferably would contain no PSRO review. As Table 3.3 indicates, this is the case.

While much care was devoted to the selection of comparison and test areas, comparisons were not randomly drawn and unknown bias may exist. While we do not feel that this bias is large, and we have made statistical adjustments beyond our matching procedures to further reduce bias, it is technically impossible to provide a quantitative measure of the degree of bias which may be present in the findings. The reader should be aware of this.

3.2.2.3 Methods of Analysis

Summary of Methodology: The study methodology was both longitudinal and cross-sectional in nature. The longitudinal aspects of the study consisted of comparisons of utilization rates in 1974 with those of 1976. The cross-sectional aspects of the study represent the comparison of active to matched comparison PSRO areas. The two comparisons jointly provide a relative comparison of change over time between active and matched PSRO areas.

No comparable data were available from SSA prior to 1974, due to major changes in the SSA data system at that time. In addition, data were not available after 1976 due to the length of bill processing time. Thus, at the time of the study, the only available longitudinal structure for pre/post-study was use of 1974 as the baseline period and 1976 as the

treatment period. Data for 1975 were not used in the analyses, since they represented a transition period from inactive to active status for the active PSROs.

Two types of analyses were performed: (1) an aggregate comparison of the group of active PSROs with the group of comparison PSROs, and (2) a disaggregated analysis comparing each active PSRO with its own matched comparison area(s). The aggregated analysis, a forced order multiple regression model, was implicitly a pre-PSRO/post-PSRO comparison, in that it accounted for utilization changes from 1974 to 1976 by a number of explanatory variables (including PSRO review measured as the percent of Medicare discharges under PSRO binding concurrent review). The disaggregated analysis was explicitly a pre-PSRO/post-PSRO comparison of the following format.

	1974 Utilization Measure	1976 Utilization Measure
Active PSRO	Active "pre" score	Active "post" score
Comparison PSRO	Comparison "pre" score	Comparison "post" score

A point to remember during this discussion is the question of varying levels of model specification. In the regression model the error term is reduced by removal of the effort of demographic adjustor variables. The disaggregated analysis, in contrast, contains no adjustments for demographic characteristics. For these reasons, the mean differences of PSROs and comparisons in the disaggregated analysis has the following composition: (True Differences + Demographic Differences + Measurement

Error). The mean differences of PSROs and comparisons in the aggregated analysis has the following composition only: True Differences + Measurement Error.

The above discussion considers the included group of PSROs as a universe. If one wishes to consider them a sample of the 203 projected PSRO areas, one encounters the additional measurement problem of sample bias. The PSROs available for analysis do not constitute a proper statistical sample of the 203 PSRO areas. Thus any extrapolation to the 203 areas made with either the aggregated or the disaggregated analysis will contain unknown and possibly large bias.

The Multiple Regression Model: To test overall differences in utilization changes between the active PSRO group and the comparison PSRO group, the following model was formulated. The form of the model is the same for all the dependent utilization variables (variables 1 to 12 in subsection 3.2.2.1).

1976 utilization level = a function of

b_1 [1/] X_1	where X_1	= 1974 utilization level
$+b_2 X_2$	X_2	= population density
$+b_3 X_3$	X_3	= occupancy rate
$+b_4 X_4$	X_4	= poverty-level population
$+b_5 X_5$	X_5	= prior Medicaid review
$+b_6 X_6$	X_6	= percent Medicare discharges under PSRO review or age of PSRO in months
$+b_i X_i$	X_i	= other independent variables

The object of the regression analyses was to assess the impact of PSRO review on utilization after proper adjustment had been made for

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[1/] Where b_1, b_2, etc; are standardized regression weights between (-1) and (+1) which indicate the relative influence of the independent variables.

pre-program utilization levels and for demographic differences which were thought to be associated with differences in utilization. Explanatory variables were forced into the regression model as follows. First, 1976 utilization was adjusted linearly for 1974 utilization.[1/] This adjusted score was then adjusted a second time, to remove the influence of demographic variables. Finally, the residual adjusted utilization scores were analyzed for the contribution of the PSRO review variable (X_6 above).

The Interaction Components of the Model: In addition to the simple, main effects of the primary independent variables there is the possibility that the independent variables also produce unique effects on utilization only in particular combinations. Algebraically, this is denoted in the regression model by adding terms to the model of the following form: $X_1 * X_2$, $X_1 * X_3$, etc. These multiplicative terms, called interactions, are treated as new, unique explanatory variables and were added to the multiple regression model as follows:

$$+ b_7 X_1 * X_2$$

$$+ b_8 X_1 * X_3$$

etc.

If an interaction of two variables, X_1 and X_2, for example, is significant, then the presence of variable X_1 changes the way X_2 affects the model. For example, if variable X_1 interacts significantly with the

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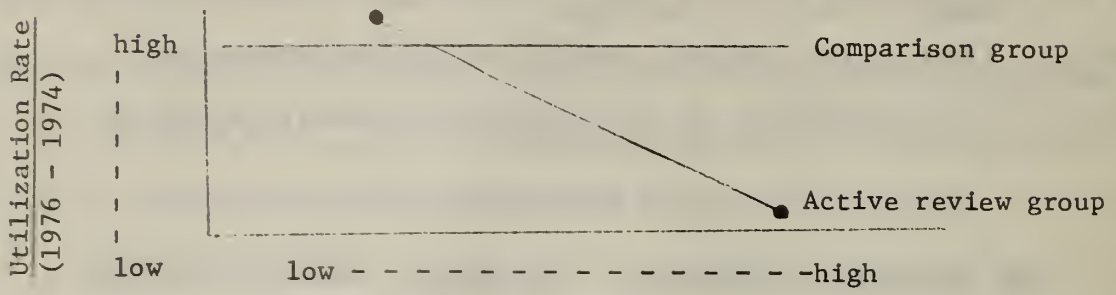
[1/] There are alternative formulations of this procedure which are mathematically equivalent. Several were considered for possible use and none were found to be superior to the others.

PSRO review variable, then one would find a different impact of review in places with less or more X_1 than the average PSRO area.[1/]

Graphically, this interaction is expressed as follows:



The reader will note that, in the graphical example, changes in the comparison group are about the same whether variable X_1, is high or low. For the active group, in the hypothetical example, high impact of review is associated with low values of X_1.

3.2.3 Findings

3.2.3.1 Aggregated Analysis

Twelve multiple regression models were developed, one for each of the dependent utilization variables listed in subsection 3.2.2.1.

Forced order regression was the technique used since logical assessment of program effects requires that utilization changes be adjusted for pre-program levels (base level) and also for unique demographic variables prior to examining the effect of the PSRO review. Thus, the order of variable entry into the regression was forced as: 1974 utilization

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[1/] The opposite effect is also possible. For simplicity we confine ourselves to the present case an an example.

level (base), demographic and other adjustment variables, program impact variable (% Medicare discharges under review or months under PSRO review), and interaction variables.

In forced order regression, as opposed to stepwise regression, accurate tests of significance can be made after the introduction of each additional explanatory variable or set of explanatory variables. Table 3.4 summarizes the information obtained from the twelve multiple regression models using the PSRO impact measure of "% Medicare Discharges under Review." Table 3.5 summarizes the results from the alternative analysis using the PSRO impact measure of "months under PSRO review." The results for the first dependent variable are explained in some detail. Interpretations of other regression results are similar.

The adequacy of a regression model is assessed by the proportion of variance in the dependent variable accounted for by the model. The maximum possible is 1.0, or 100%. Most regression models do not approach accounting for 100% of the variance. In the column labelled R^2 in Table 3.4 note that the "Live Discharges-1976-First Half" model accounts for 97% of the variance in the data. The regression model is, therefore, extremely well-fitted to the data. The increments which add up to the total of .9706 are in the preceding columns. Thus, "Base" (1974 Live Discharges) by itself, accounts for .9561 or over 95% of the variance. The "Demographics," as a group, add .0078 or .78%. The "PSRO review" adds .0026 or .26%. The interaction of "Base with Review" adds .0001 or 0.01%; the interaction of "Demographics with Review" adds .0040 to 0.4%. In this particular

model, only the "Base" variable was statistically significant, with $p<.001$, indicated by the superscript "d" on the .9561.

The other eleven utilization model summaries in Table 3.4 are interpreted in the same fashion. For those models with significant demographic variables and/or demographic interactions, the specific demographics which were significantly different from zero in their effect are indicated in the last two columns. The direction of demographic interaction effects is indicated by (+) or (-). A (-) value has a connotation of program impact in the interactions.

Scanning the column in Table 3.4 labeled "PSRO Review," we can state, in summary, that within the universe of 18 PSROs studied, PSRO acute care concurrent review was found to have no effect significantly different from zero on <u>any</u> of the twelve utilization variables studied. In general, the interactions of review with demographic characteristics which are significantly different from zero are either in the wrong direction (i.e. associated with <u>increased</u> utilization) or of very small magnitude, or both.

<u>This analysis offers no evidence that, on the average, extent of PSRO acute care concurrent review, expressed as percent discharges under review, has any effect, whether positive or negative, on hospital utilization by Medicare patients in the 18 demographic areas studied. No extrapolation to the Nation is technically appropriate.</u>

3.2.3.2 Alternative Aggregated Analysis

In the analysis above, the measure of "PSRO implementation" is "the percent of Medicare discharges under review." In preliminary internal

TABLE 3.4

SUMMARY OF PROPORTIONAL INCREMENTS TO EXPLAINED VARIANCE: FORCED ORDER REGRESSION

PSRO Review and Comparison Areas Review in Proportion Form (% Medicare Discharges) Under Review

Variable=Criterion	Base	Demographic Variables	PSRO Review	Base X. Rev.	Demo. X Rev.	R^2	Significant Demographic Variables	Significant Interactions
1 = (L DIS F)	.9561[d]	.0078	.0026	.0001	.0040	.9706		
2 = (L DIS S)	.8789[d]	.0163	.0029	.0006	.0100	.9087		
3 = (L DOC F)	.9310[d]	.0182[b]	.0015	.0001	.0146[a]	.9654	Dens. (+)	(R X Dens.) (+)
4 = (L DOC S)	.9391[d]	.0122[a]	.0000	.0000	.0122[a]	.9635	Dens. (+)	(R X Dens.) (+)
5 = (T DOC F)	.9147[d]	.0231[b]	.0020	.0000	.0185[a]	.9583	Dens. (+); Opeloc. (+)	(R X Dens.) (+)
6 = (T DOC S)	.9334[d]	.0121	.0000	.0001	.0144[a]	.9599		(R X Dens.) (+)
7 = (ADM F)	.9665[d]	.0033	.0017	.0005	.0017	.9737		
8 = (ADM S)	.9651[d]	.0060	.0000	.0010	.0046	.9766		
9 = (L LOS F)	.9606[d]	.0145[d]	.0004	.0001	.0092[b]	.9848	Dens. (+); Opeloc. (+)	(R X Desn. (+); R X Beds) (-)
10 = (L LOS S)	.9651[d]	.0064	.0001	.0000	.0069	.9785		
11 = (T LOS F)	.9591[d]	.0138[d]	.0006	.0005	.0096[c]	.9834	Dens. (+); Opeloc. (+)	(R X Dens. (+); R X Beds) (-)
12 = (T LOS S)	.9675[d]	.0051	.0000	.0000	.0061	.9787		

[a](p<.05); [b](p<.01); [c](p<.005); [d](p<.001)

reviews of the findings, it was pointed out that this measure only indirectly took account of the length of time the PSRO had been in operation. Since it was hypothesized that length of time elapsed was related to impact, an alternative analysis was devised to test this hypothesis.

A true time series of data on individual PSROs would have been the appropriate configuration of data to test the proposed hypothesis. That is, it was necessary to have several annual measures of utilization for each PSRO and study their trends. The short length of time that the PSRO program had been operational precluded this analysis. An approximation of this analysis was devised instead. For each PSRO in the analysis, its "age" in months was recorded as a data element. This provided a cross-sectional analysis in which various utilization rates were associated with various lengths of operation for <u>different</u> PSROs, not for the <u>same</u> PSRO.

Results from this analysis are presented in Table 3.5. Findings of no impact would have tended to discredit "PSRO maturity" as a significant influence of impact. It was found, instead, that PSRO maturity, in cross-sectional analysis, had small but statistically significant associations with changes in Live Discharges/1,000 - first half of 1976, Total Days of Care/1,000 - first half of 1976, and Admissions/1,000 - first half of 1976. There are a number of significant interactions with length of PSRO review, some of which are in a favorable direction and some in an unfavorable direction.

Although the alternative analyses, appear to be much more favorable to the PSRO program than the original analyses, they were not presented as the primary analyses because they imply a currently undocumentable inference about the PSRO program. The measure of time elapsed under PSRO review which is used in the alternative models is cross-sectional not longitudinal. That is, the data contains one time-related measure for each PSRO, rather than several measures for each PSRO in a related time series. A true time series analyses was impossible at the present time for the following reasons. The Social Security data on Medicare patients cannot be arrayed for analysis in time periods of less than six month's duration, and is unavailable in useable form for a given time period until at least six months after the end of the time period in question. A true time series analysis of PSRO data will not be possible until at least July 1979. Even then there will be a minimal array of useable post-implementation data points: July 1975, December 1975, July 1976, December 1976, July 1977, December 1977, July 1978, and December 1978. There is seasonality in hospital utilization data; consequently the July and December figures are not directly comparable. This series of data points would provide four pairs of related measures, rather than eight independent measures. This would be the bare minimum of data needed to make even tentative inferences regarding progressive PSRO impact over time using the more appropriate longitudinal approach.

In summary, the claim that the impact of PSRO will increase over time could not be directly tested at the time of the present study, due to lack of time series data of technically acceptable lengths on the 18 PSROs studied. A finding of "no impact" for "months under review" in

the cross-sectional models would have provided tentative evidence that PSRO impact is not related to the elapse of time. In point of fact, "months under review" does significantly affect admissions, discharges, and total Days of Care in a cross-sectional analysis. Thus, the hypothesis that PSRO impact is related to the elapse of time cannot be refuted at the present time, but, due to the above methodological problems, neither is it proved.

TABLE 3.5

Acute Care Medicare Utilization Models - Alternative Analysis

SUMMARY OF PROPORTIONAL INCREMENTS TO EXPLAINED-VARIANCE: FORCED ORDER REGRESSION

PSRO Review and Comparison Areas Review Expressed as Months Under Binding Medicare Review

Variable=Criterion	Base	Demographic Variables	PSRO Review	Base X Rev.	Demo. X Rev.	R^2	Significant Demographic Variables	Significant Interactions
1 = (L DIS F)	.9561[d]	.0078	.0037[a]	.0000	.0053	.9728[d]		
2 = (L DIS S)	.8789[d]	.0163	.0029	.0008	.0116	.9105[d]		
3 = (L DOC F)	.9310[d]	.0182[b]	.0032	.0003	.0146[a]	.9673[d]	Dens. (+)	(R X Dens.) (+)
4 = (L DOC S)	.9391[d]	.0122[a]	.0003	.0000	.0129[a]	.9645[d]	Dens. (+)	(R X Dens.) (+)
5 = (T DOC F)	.9147[d]	.0231[c]	.0053[a]	.0001	.0192[b]	.9624[d]	Dens. (+); Opeloc. (+)	(R X Dens.) (+)
6 = (T DOC S)	.9334[d]	.0121	.0004	.0000	.0151[a]	.9610[d]		(R X Dens.) (+)
7 = (ADM F)	.9665[d]	.0033	.0034[a]	.0002	.0035	.9768[d]		
8 = (ADM S)	.9651[d]	.0060	.0008	.0002	.0053	.9774[d]		
9 = (L LOS F)	.9606[d]	.0145[d]	.0013	.0002	.0090[c]	.9855[d]	Dens. (+); Opeloc. (+)	(R X Dens., (+) R X Beds) (-)
10 = (L LOS S)	.9651[d]	.0064	.0000	.0002	.0077[a]	.9794[d]		
11 = (T LOS F)	.9591[d]	.0138[d]	.0014	.0005	.0103[c]	.9851[d]	Dens. (+); Opeloc. (+)	(R X Dens. (+) R X Beds) (-)
12 = (T LOS S)	.9675[d]	.0051	.0000	.0000	.0071[a]	.9797[d]		

[a](p<.05); [b](p<.01); [c](p<.005); [d](p<.001)

3.2.3.3 Disaggregated Analysis

A short exposition on the process of model building would he helpful to further the reader's understanding of our analyses. Every quantitative model seeks to explain in a simple way either cause-and-effect or correlational relationships in the data. Because of both technical and philcsophical considerations, the preferred model is the most parsimonious model. That is, the preferred model uses the fewest explanatory variables, and, further, uses explanatory variables which are orthogonal, or mutually independent (uncorrelated). The test for model adequacy in a multiple regression analysis is the proportion of the variance in the data which is accounted for by the model. Our tabulated results indicate that the proportion of variance accounted for is at least .90, or 90%. Thus, by any standard, our models are extremely well fitted to the data. Orthogonality, or independence, of the explanatory variables was maintained by choosing explanatory variables with relatively low intercorrelations.

The very small portion of the variance still unaccounted for in the models could be pure random error. It could also be hypothesized that there is a combination of random error and the interaction of PSRO with some currently unidentifed explanatory variable. The statisticians among our readers will be inclined to regard this as a form of "snatching at straws" in view of the extremely good fit of the present set of explanatory variables. Nevertheless, for program managers it would be extremely useful to identify the outlier, or extreme case, PSROs on both the positive and negative impact side. There is strong interest in examining the best performances among the 18 PSROs for distinctive characteristics.

The disaggregated model is therefore presented below with the following caveats:

(1) Deviations from zero impact, as computed from the aggregated model, are theoretically measures of random error and not measures of impact.

(2) In any case, if one nevertheless proceeds to examine deviations, it is totally illogical to treat positive deviations as random error, while treating negative deviations as program impact. The only logical course is to examine both sets of PSROs and attempt to identify some explanatory variable that is simultaneously present in all sites with positive deviations and absent from all the sites with negative deviations.

(3) If such a factor is indeed identified, it cannot account for more than 1% to 3.5% of the variance, because this is all the residual variance in the present model. It would, therefore, constitute a very small effect. On the other hand, in this particular data set, small effects could translate into sizable dollar savings.

(4) The disaggregation is NOT adjusted for demographic characteristics, while the aggregated analysis was so adjusted.

(5) The deviations from zero are not significantly different from chance, and are usually in the wrong direction.

Table 3.6 contains a summary of the disaggregated analysis. The figures in the table were computed as follows: The changes in utilization are expressed as proportions computed by comparing 1976 expected values in the active PSROs (as forecast from 1974/75 ratios to their comparison areas), with 1976 actual active PSRO area utilization values. The methodology of forecasting the expected values was validated on the 1974/75 ratios and found to be highly reliable. In reading the table, a negative proportion indicates the desired PSRO effect, i.e., a decrease in actual 1976 rates as compared to expected or forecasted 1976 rates. For example, PSRO A had a

TABLE 3.6

MEASURES OF UTILIZATION CHANGES PRE AND POST PSRO (1976 versus 1974) FOR ACTIVE PSROs EXPRESSED AS PROPORTIONS

Census Region		RESPONDENT VARIABLES 1	2	3	4	5	6	7	8	9	10	11	12
PSROs - WESTERN													
(1)	PSRO A	.046	.034	.107	.044	.113	.052	.049	.007	.043	.020	.035	.011
(4)	PSRO B	.021	-.029	.011	.047	.012	.055	-.018	.009	-.021	.018	.018	.031
(10)	PSRO C	-.032	-.040	.006	.081	.016	.086	.044	.111	.029	.098	-.029	-.034
(36)	PSRO D	-.039	-.051	-.006	-.034	-.022	-.054	.002	-.021	-.016	-.035	-.017	-.029
(38)	PSRO E	.013	.009	.029	.035	.019	.033	.013	.027	.016	.036	.016	.018
(41)	PSRO F	.062	.045	-.143	-.102	-.143	-.097	-.155	-.105	-.153	-.104	-.030	.030
(43)	PSRO G	.015	.098	.062	.039	.043	.047	.026	.017	.004	.032	.008	.012
(45)	PSRO H	-.065	.032	-.106	-.136	-.144	-.157	-.014	-.078	-.021	-.091	-.068	-.042
PSROs - SOUTH													
(19)	PSRO I	-.009	.065	.075	.080	.102	.111	.072	.059	.068	.067	-.004	.021
(22)	PSRO J	-.080	-.085	-.005	.065	.004	.075	.054	.018	.056	.027	-.056	.058
(27)	PSRO K	.024	.010	.043	-.011	.036	.004	.015	-.001	.005	-.001	.015	-.014
(33)	PSRO L	-.025	-.026	-.027	-.006	-.035	-.021	.007	.020	.010	.016	-.003	-.015
(55)	PSRO M	-.016	.014	.005	.048	-.006	.038	.012	.050	.007	.052	-.005	-.007
PSROs - NORTH CENTRAL													
(16)	PSRO N	-.074	-.041	-.130	-.060	-.142	-.065	-.075	-.040	-.076	-.036	-.065	-.002
(30)	PSRO O	.032	.049	.002	.025	.007	.026	-.037	0	-.028	.010	.040	.022
(49)	PSRO P	-.011	-.019	-.056	-.031	-.058	-.035	-.046	-.010	-.051	-.013	-.009	-.021
(52)	PSRO Q	.012	.027	.042	.025	.056	.039	.039	0	.049	.009	-.003	.030
PSROs - NORTH EAST													
(57)	PSRO R	.007	.011	-.046	-.072	-.020	-.057	-.031	-.078	-.008	-.065	-.002	-.003
Ratio of Favorable to Unfavorable 1/		9:9	7:11	8:10	8:10	8:10	7:11	7:11	7:11	8:10	7:11	12:6	9:9

VARIABLES:

1. Live Discharges/1,000 - First Half of Year
2. Live Discharges/1,000 - Second Half of Year
3. Live Days of Care/1,000 - First Half of Year
4. Live Days of Care/1,000 - Second Half of Year
5. Total Days of Care/1,000 - First Half of Year
6. Total Days of Care/1,000 - Second Half of Year
7. Length of Stay (Live Discharges) - First Half of Year
8. Length of Stay (Live Discharges) - Second Half of Year
9. Length of Stay (Total Discharges) - First Half of Year
10. Length of Stay (Total Discharges) - Second Half of Year
11. Admission/1,000 - First Half of Year
12. Admission/1,000 - Second Half of Year

1/ All differences are non-significant at the .05 level, using the binomical sign test.

(+0.046) difference on the first variable between actual rate and forecasted rate for 1976. PSRO A had, therefore, 4.6% more bed days than statistically expected if PSRO area A had had no PSRO effect in 1976.[1/] As another example, PSRO C had a (-0.032) difference on the first variable between actual rate and forecasted rate for 1976. PSRO C had, therefore, 3.2% fewer bed days than statistically expected if PSRO area C had had no PSRO effect in 1976.

The measures of utilization in Table 3.6 are highly intercorrelated, but, except for Length of Stay, none of the columns is an exact transformation of other columns. Thus one can make some gross identification of the PSROs with apparent impact for 1974-1976 by counting the negative values in each row. Clearly these are PSROs D, F, and H in the Western Census Region, PSRO L in the South, PSROs N and P in the North Central, and PSRO R in the North East.

It should be noted that no specific reason for observed rate changes presented above can be inferred, except in a judgmental fashion by persons acquainted with the PSROs in question. What is presented is merely a crude index serving to rank the subject PSROs on deviations from zero.

Concurrently with this study, in-depth case studies were performed in six of the areas for which Medicare rate data were available; net percent changes in the rates of live days of care (LDOC) per thousand Medicare enrollees were calculated.[2/] Three of the case study areas exhibited decreases in this rate,

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[1/] Note that the total proportions are converted to percentage notation by multiplying by 100.

[2/] For the case studies, the net change in LDOC/1,000 was calculated by computing the difference in the absolute percent changes in the case study (active) areas and their matched comparison areas. The reader should observe that this is a slightly different procedure than that utilized in the disaggregate analyses presented in Table 3.6.

remaining three showed increases in this rate from 1974 to 1976. These findings support the general analysis above. An analysis of the environmental (non-PSRO) factors in these areas revealed that these factors probably did not play a significant role in affecting rate changes. In addition, within these case study areas no particular "type" of PSRO was found to be associated with a finding of decreased utilization rates. On the contrary, dissimilar PSRO characteristics (e.g., approaches to delegation) were observed among areas exhibiting decreased utilization rates.

3.3 PSRO Impact on Utilization Patterns: Inferences from Sample of Hospital Discharge Abstracts

3.3.1 Study Methods

An analysis of PSRO review impact on length of stay patterns and patient mix was conducted using a data base of 1.19 million Medicare and Medicaid hospital patient discharge abstracts covering the period January 1974 to September 1976. Data were obtained from 95 of the total of 136 hospitals which met the following two conditions. They both subscribed to either of two participating abstract services and had begun Medicare-binding PSRO concurrent review between mid-September 1974 and January 1, 1976.[1,2]

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[1] Participating services were the Commission on Professional and Hospital Activities and the California Health Data Corporation.

[2] Of the 468 non-Federal short-stay hospitals beginning PSRO binding review in the period, all 136 (29%) which also subscribed to the participating abstract services were asked to participate.

A stratified random sample was then drawn of 94 abstracting hospitals across the country which had not performed PSRO review in the study period.[1/] Of these, 52 hospitals agreed to participate.

The analysis examined pre/post differences between PSRO and non-PSRO review hospitals in terms of changes in average length of stay, percentages of long- (over the 1975 75th percentile) and short-staying (under the 1975 5th percentile) patients, and illness severity. The pre-period was defined as the first three quarters of 1974; the post-period was the first three quarters of 1976. Differences in hospital patient mix (diagnosis group, age, multiple vs. single diagnosis and operated vs. not operated) and regional length of stay patterns were controlled by computing an expected length of stay for each patient from the Commission on Professional and Hospital Activities' 1975 regional stay data base (composed of 15.4 million discharges in 1,887 PAS hospitals). A weighted least squares model was used to control for differences in length of stay due to patient mix, hospital characteristics (hospital size, teaching status and occupancy rate), and area characteristics (hospital beds and physicians per 1,000 population). Analyses were conducted for all Federal beneficiary patients and for 22 major diagnosis groupings. Additional analyses were conducted on length of stay and for case mix

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[1/] Comparison hospitals were not matched to the PSRO hospitals. Rather, the sample was designed for efficient use in a regression analysis by the range of values for variables thought to affect ALOS or PSRO impact.

controlled for illness severity at admission for 23 discrete diagnoses, using SysteMetrics' "Staging Methodology."[1,2]

3.3.2 Results

The pre post comparative analyses produced the following findings:

- PSRO and non-PSRO hospital groups both experienced decreases in average length of stay for all patients and for many of the diagnostic groups.
- PSRO hospitals had a larger drop in Medicare patients ALOS (adjusted for ELOS), by 0.23 days, than did non-PSRO hospitals, but PSRO hospitals had a smaller drop, by 0.20 days, for Medicaid patients than did non-PSRO hospitals. Both deviations were significantly different from zero by statistical test but were rather small, representing about 2% differences. The weighted[3] average pooled effect was a .09 days' decrease.
- An increase in case mix severity in both PSRO and non-PSRO hospitals was indicated by both the expected lengths of stay and the illness severity staging index. There was a greater shift to more severely ill Medicaid patients in the PSRO review hospitals than in comparison hospitals. See Table 3.6c and 3.7c for staging results. (NOTE: ELOS is not explicitly shown, but equals the difference between adjusted and unadjusted change in ALOS in the right-most columns of Table 3.6a and 3.7a). For Medicare, severity decreased slightly more in PSRO hospitals than in comparisons.

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[1] Gonnella, J. and Goran, M.J., "Quality of Patient Care - A Measurement of Change: The Staging Concept," Medical Care 13:467-473, 1975.

[2] Gonnella, J., Louis, D.Z., and McCord, J.J., "The Staging Concept: An Approach to the Assessment of Outcome of Ambulatory Care." Medical Care 14:13-21, 1976.

[3] Weighted by Medicare and Medicaid discharge volumes.

- In the PSRO review hospitals, Medicare and Medicaid patient discharges and days of care were a smaller proportion of all (Federal plus non-Federal) patients in the post vs. the pre-period. While this is consistent with the hypothesis of PSRO-induced reductions in utilization, lack of proper population denominators precludes drawing any firm conclusions from this finding.
- PSRO impact on reducing Medicare ALOS was significantly different between areas with high and low ratios of extended care facility (ECF) beds per 1,000 population aged 65+. There was no difference in the drop in ALOS between PSRO and non-PSRO hospitals in areas with low (21.50) ECF bed ratios, while in areas in a high ratio, PSRO hospitals outperform the comparisons by 0.58 days.
- PSRO hospitals had a greater decrease than the comparisons in the percent of long stays for both Medicare and Medicaid patients, but the difference was statistically significant only for Medicare.
- Non-delegated PSRO hospitals had larger decreases in ALOS than delegated PSRO hospitals. Non-delegated PSRO hospitals had a statistically significant greater drop by .32 days in ALOS for Medicare and a non-significant smaller drop by .16 days for Medicaid than the comparisons. On the other hand, delegated PSRO hospitals showed a statistically significant lower drop by .29 days for Medicaid and non-significant greater drop by .15 days for Medicare than the comparison hospitals.
- PSRO review hospitals showed greater decreases in ALOS and/or percent of long stays for Medicare patients in about one-third of the 22 diagnosis groups and for Medicaid patients in about half, than did comparisons. However, few of these differences were statistically significant.

Table 3.6 presents the data summarized above for the Medicare population while Table 3.7 contains comparable Medicaid data. Both tables contain pre-PSRO review data, post-PSRO review data, gross differences and selected differences adjusted for ELOS. The intersection of the Gross Difference "column" and the Difference (PSRO-Comp) "row" presents relative differences. For instance, in Table 3.6 the number -0.21 indicates the relative difference between PSRO and comparison hospitals on pre/post variation in ALOS. [See A. Average Length of Stay (ALOS) under Gross Difference and Difference (PSRO-Comp)]

3.3.3 Discussion

Several aspects of the study limit the conclusions which can be drawn. With sample response rates of 70% for PSRO hospitals and 55% for comparisons, the possibility of self-selection bias cannot be ruled out. Furthermore, hospitals studied were sampled from those subscribing to abstract services continuously since January 1, 1974. Thus, at best, the results of this study are only generalizable to hospitals on these abstract services.[1/] About 60% of the PSRO hospitals in the sample studied had begun binding review in the quarter immediately preceding the post-period. Thus, the results reflect, for the most part, only the initial effects of PSRO review. Finally, in about 80% of the comparisons discussed below, the hospital group which had the larger decrease in length of stay or percent of long-staying patients also started out at a higher level. Hence, a "catch-up" effect may be occurring.

[1/] Hospitals subscribing to the abstract services account for 43% of all U.S. non-Federal short-stay hospital discharges and represent about 23% of the hospitals.

Table 3.6

Analysis of a Sample of Hospital Discharge Abstract Data

Changes in Medicare Utilization
January - September 1974 vs. January - September 1976

Table 3.6a

	Pre PSRO Review	Post PSRO Review	Difference (Post-Pre) Gross	Adjusted for ELOS
A. Average Length of Stay (ALOS):				
PSRO Hospitals	10.79	10.22	-0.57	-0.75*
Comparison Hospitals	10.72	10.36	-0.36	-0.52*
Difference (PSRO- Comp)	+ 0.07	-0.14	-0.21	-0.23*

Table 3.6b

B. Percent of Long Staying Patients (LOS> 75th percentile LOS for 1975):				
PSRO Hospitals	24.4%	20.6%	-3.8% *	--
Comparison Hospitals	22.8%	19.9%	-2.9% *	--
Difference	+1.6%	+0.7%	-0.9% *	--

Table 3.6c

C. Percent of Stage I Patients (Lowest Illness Severity Level):				
I. Diagnoses Not Necessarily Requiring Hospitalization at Stage 1:				
PSRO Hospitals	60%	56%	-4%*	--
Comparison Hospitals	62%	59%	-3%*	--
II. Diagnoses Requiring Hospitalization at Stage I:				
PSRO Hospitals	75%	78%	-2%	--
Comparison Hospitals	76%	74%	-2%	--

* Pre-Post difference is statistically significant at the 5% level

Table 3.7

Analysis of a Sample of Hospital Discharge Abstract Data

Changes in Medicaid Utilization:
January - September 1974 vs. January - September 1976

	Pre Post Review	Post PSRO Review	Difference (Pre-Post Gross	Adjusted for ELOS
A. Average Length of Stay				
PSRO Hospitals	6.09	5.87	-0.22	-0.44*
Comparison Hospitals	6.95	6.40	-0.55	-0.64*
Difference (PSRO-Comp)	-0.86	-0,53	+0.33	+0.20*
B. Percent of Long Staying Patients (LOS 75th percentile LOS for 1975)				
PSRO Hospitals	24.83%	20.56%	-4.27% *	--
Comparison Hospitals	25.43%	21.44%	-3.99% *	--
Difference	-0.60%	-0.88%	-0.28%	--
C. Percent of Stage I Patients (Lowest Illness Severity Level):				
I. Diagnoses not Necessarily Requiring Hospitalization at Stage I:				
PSRO Hospitals	67%	60%	-7%*	
Comparison Hospitals	67%	66%	-1%	
II. Diagnoses Requiring Hospitalization at Stage I:				
PSRO Hospitals	84%	82%	-2%	
Comparison Hospitals	82%	83%	+1%	

*Pre-Post difference is statistically significant at the 5% level

The results of these analyses indicate a general decline in both length of stay and proportion of long-staying patients at a time when the illness severity of case mix may be increasing. PSRO review seems to have had some small additional effect on increasing case mix severity for Medicaid patients and reducing ALOS and percent long stays for Medicare patients. Further study is required to determine if the case mix severity measures are reflecting a real movement toward more appropriate hospital use; or rather, improvements in medical recording, perhaps attributable to PSRO or general factors such as malpractice concerns. To the extent that PSRO is associated with a larger shift, PSRO may be seen as moving towards its goals of more appropriate hospital use and improvement in the quality of medical records.

3.4 A Comprehensive Utilization Analysis: The Colorado Experience

3.4.1 Study Methods

A study was conducted to determine whether there were reductions in Medicare and Medicaid hospital utilization associated with the Colorado Foundation for Medical Care's (CFMC) Colorado Admissions Program (CAP) of binding non-delegated hospital concurrent review of Medicare and Medicaid patients. Review began in 1973 and continued unchanged when the CFMC was designated as Colorado's statewide PSRO in June 1974.

Two modes of analyses were used. A detailed analysis of Colorado Medicare and Medicaid utilization by diagnosis and hospital type was conducted by comparing post-review years 1974 and 1975 to a base year of 1972. Additionally, CAP-induced reductions in Medicare utilization were estimated by controlling for longitudinal changes which might have otherwise occurred in the absence of PSRO review. In order to estimate net

savings in days of care/1,000 associated with CAP, SSA data on Medicare covered days of care/1,000 for residents of Kansas and Nebraska were used to estimate Colorado utilization in the absence of CAP. The percentage change in Kansas/Nebraska (combined) between a base period of 1969-1972 and the post-CAP years 1974 and 1975 was applied to pre-CAP Colorado utilization and the actual Colorado post-CAP utilization rate was compared with the rate thus estimated. CAP utilization savings (days saved) were estimated as the difference between the actual and the projected rates.

3.4.2 Findings

Analysis of a complete set of paid Medicare patient claims for short-stay non-Federal hospitals in Colorado revealed the following changes in Colorado utilization relative to the pre-CAP base year 1972:

- Total days of care per 1,000 enrollees decreased. The utilization rate was 171 days/1,000 (-4.2%) below the base for 1974 and 101 days/1,000 (-2.5%) for 1975.
- Discharges per 1,000 eligibles increased by about 2%.
- Average lengths of stay (ALOS) decreased. ALOS was 0.63 days below the base (6.0%) in 1974 and 0.47 (-4.5) in 1975.
- Decreases in ALOS were twice as large for medical cases as for surgical cases. Surgical ALOS decreases were due entirely to shortening the post-operative stay.
- There was a significant shift in case mix; however, this had virtually no effect on ALOS.
- Changes in ALOS were consistent across the hospital groups and most of the diagnostic groups.

The results of the comparative analysis and the estimates of CAP savings are presented below:

- There were 310 fewer Medicare covered hospital days per 1,000 enrollees in 1974 than expected and 127 days fewer in 1975. These represent utilization reductions of 8% to 3.4% respectively.
- The savings are due almost entirely to lesser increases in the Colorado admission rate than in Kansas/Nebraska, rather than increased reductions in ALOS.
- Savings in days per 1,000 continued to drop in 1976, the fourth year of the CAP program. The magnitude of the continuing drop in savings in 1976 could not be estimated reliably because the 1976 data came from a different time series of data going back only to 1974.

The results of both longitudinal and cross-sectional Medicare analyses show a general decrease in days per 1,000 following the introduction of CAP, but indicate different sources of the decrease. Within Colorado, the decrease is due to shorter stays. But relative to Kansas/Nebraska, the drop is due to different rates of increase in admissions per 1,000. This discrepancy is resolved by recognizing that Kansas/Nebraska reduced ALOS by amounts similar to Colorado, but had larger annual increases in their admission rates. Thus, the changes in Colorado ALOS cannot be attributed solely to PSRO review.

Recognizing that methodological issues in the choice of comparison States and the estimation model existed, two alternative estimation methods using these data plus a comparison with NCHS estimates for the

age 65+ population of the western region were also prepared. They confirmed the direction and general magnitude of the original estimated savings.

The study also examined CAP impact on Medicaid hospital utilization. Relative to Colorado Medicaid utilization in the base year 1972:

- Medicaid days of care per 1,000 registered eligibles was lower by 110 days/1,000 (-8.29%) in 1974 and 90 days/1,000 (-6.7%) in 1975.
- Average lengths of stay were higher by 0.2 and 0.1 days in 1974 and 1975 respectively.
- Discharges per 1,000 eligibles were lower by 22 discharges/1,000 (-10.5%) and 16 discharges/1,000 (-7.6%) in 1974 and 1975 respectively.
- Changes in case mix had the effect of diminishing the magnitude of the rise in ALOS by 0.07 days in 1974 and 0.10 days in 1975.

It was not possible to perform a comparative analysis of Medicaid hospital use due to unavailability of adequate baseline data in the comparison States.

3.4.3 Discussion

The possibility exists that exogenous factors and CFMC activities other than CAP account for an unknown portion of the savings in Colorado Medicare utilization which the analysis ascribes to CAP. For example, visual examination of the Colorado, Kansas and Nebraska admission rate trend lines revealed a sharp divergence of slope beginning with 1971, possibly related to CFMC and the Colorado Medical Society's cost and quality control efforts in the period. In addition, the number of short-

term Medicare certified beds per 1,000 general population decreased from 1972 to 1975 by about 2% more in Colorado than in Kansas/Nebraska.

The general results of this study are findings of decreases on the order of 5-8% in both Medicare and Medicaid days of care/1,000 associated with the implementation of CAP concurrent review in Colorado. Methodological considerations in the comparative as well as the longitudinal analyses limit the degree to which these decreases can be solely ascribed to effects of the PSRO review program. In addition to these general results it was noted that impacts in succeeding years are lower than in the first full year of CAP review.

Another interesting finding was that the major effect of CAP was achieved through moderation of the admission rates. To the extent that moderation of the admission rate is a CAP impact, it must be attributed to a voluntary compliance and, perhaps, subtle pressures since CAP pre-admission review of elective hospitalization has been entirely voluntary and denials of admission certification have never exceeded 25 per year (about 0.02% of admissions).

4. QUALITY ASSURANCE ACTIVITIES

An intent of the PSRO legislation is to ensure that health care is provided at an acceptable level of quality to the recipients of Title V, Title XVIII, and Title XIX program services. The aspect of the PSRO program which especially concentrates on the quality of care is the Medical Care Evaluation (MCE) study component. This subsection summarizes report findings on MCEs.

4.1 Medical Care Evaluation (MCE)

Medical audits, the primary part of the MCE process, are not unique to the PSRO program. They have a precedent in hospital activities performed in response to requirements of the Joint Commission on Accreditation of Hospitals (JCAH). They were also mandated by a section of the original (1966) Medicare regulations. The significant contributions of the PSRO program have been to make the PSRO responsible for seeing that these evaluations are carried out and more importantly to require that the effectiveness of action to correct deficiencies in care found in the initial audit be confirmed by a follow-up evaluation, or reaudit.

Most PSROs have implemented MCEs after work was started on concurrent review. In general, this has been about one year after the PSRO achieved conditional status. When the PSRO evaluation was in its formative stages little information about MCE activities was available. As the study progressed, however, it became evident that reliable MCE data were becoming more abundant, and a joint effort was begun by the Health Standards and Quality Bureau, HCFA (previously the Bureau of Quality Assurance) and OPEL to evaluate the program's MCE activities.

The examination of MCE study activities was based on three strategies: (a) to provide a status report on the overall level and distribution of MCE activity, (b) to determine the effectiveness of the MCE process, defined as changes of significance in medical care process and/or patient outcomes, by examining the results of a sample of completed MCEs in four topic categories judged to have high impact potential, and (c) to assess national MCE activity as a whole by examining topic selection and follow-up procedures among the universe of studies reported as of June 1, 1977.

Evaluation was made possible by the existence of the PSRO Management Infomation System (PMIS), through which reports of completed audits and reaudits become available for analysis. Lags in the data processing system, however, can result in a delay of up to seven months from the time an MCE is completed to the time it is included in the data base. Thus the number of MCEs reported, especially for the more recent quarters, tends to be an underestimate.[1/] However, for the purpose of this review, it has been assumed that the studies reported in the data base fairly represent the areas of medical care in which studies have been done.

4.2 MCE Status Report

Data available through the PMIS show that PSRO medical care evaluation activity is rapidly accelerating across the country. While only a few hundred audits were reported for 1975, several thousand MCE studies were reported for 1976, and the quarterly figures for 1977 are still rising. Progress in MCE implementation is not uniform, however. Of the 56 PSROs

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[1/] The data base available for these analyses as of June 1, 1977, for example, included 367 initial audits reported for 1975, 2,517 for 1976 and 20 for the first quarter of 1977. As of August 15, 1977, these figures were 392, 3,467, and 1,342 respectively.

reporting MCEs in calendar years 1975 and 1976, ten accounted for 45% of the total studies. Slightly more than 45% of the audits were done on medical topics and about the same proportion on surgical topics, with the remaining 9% focusing on administrative and miscellaneous procedures. When the audit topics were classified into 305 topic categories, the 20 most frequent topic categories accounted for over half of the studies done. Myocardial infarction, pneumonia, cholecystectomy, and appendectomy were the four most frequently audited topic categories. The data suggest that the predominance of the top twenty topic categories is lessening over time, but tests of rank correlation show that the trend is not statistically significant thus far.

No attempt was made to evaluate the compliance of hospitals or PSROs regarding requirements that a minimum number of initial MCEs be submitted each year. Since this requirement was issued in January 1977, compliance cannot be assessed before March 1978.

4.3 Assessment of a Sample of Completed MCEs

The second protocol of the MCE evaluation examined studies which had completed the audit/reaudit cycle. Due to lags in the reporting system and the fact that reaudits need not be completed until a year after the initial audit, the number of such studies represented in the PMIS data base is small. Of the 132 completed studies reported in the PMIS and others solicited in a canvas of the PSROs, 37 in the four most frequently reported topic categories were selected for analysis. Documentation for these studies was solicited from the hospitals through the PSROs.

The evaluation questions asked of these studies were: Was the study process done well? Were deficiencies in medical care identified? Was action taken to correct these deficiencies? Was improvement in care demonstrated in terms of reduced numbers of deficiencies found at the time of the reaudit?

Taken in total, approximately 95% of the MCE studies examined were judged to have followed acceptable research procedures. Whether or not such procedures were acceptable, each of the MCE studies examined identified significant deficiencies and reduced the rate of variation from criteria by the time of reaudit. The deficiencies seem to fall into six major problem areas. These include failure to complete routine admission procedures and work-up, failure to follow accepted diagnostic procedures, failure to provide adequate disease-specific treatment, inappropriate utilization, unjustified patient outcomes, and failure to adequately document patient progress.

When analysis is performed on complete audit and reaudit combinations, the MCE appears to be an effective tool for the discovery and resolution of problems. Results were produced from all medical audits whether or not their process was optimal. Problem areas were identified in both the process of care and patient outcome. A significant finding of the study is that among the MCEs in this sample, 68% of all deficiencies found after initial audits were removed by the time of reaudit.

4.4 Assessment of MCE Topic Selection and Follow-up

Although overall impact assessment of MCEs is premature due to the small number of reaudits reported at this time, two necessary conditions

for impact can, however, be examined among the vast majority of studies which have been reported only through the initial audit: whether MCE topics being chosen have the potential to identify important problem areas and whether action is being taken to remove problems once they are identified.

Present PSRO practices in choosing topics are consistent with the goal of identifying problem areas in medical care and patient outcome. The degree of implementation of follow-up procedures also appears at this time to be consistent with the goal of removing these problem areas. In selecting medical topics, PSROs tend to choose diseases which are the chief causes of death in the country, except for carcinoma. The surgical procedures which are most frequently carried out in this country, except those relating to trauma, tend to be the most frequently selected surgical topic categories. By choosing these frequent diseases and procedures, which encompass many patients, physicians, and ancillary services, the program has a reasonable chance of effectively uncovering problem areas at this time.

Aside from the fact that topics are chosen because they are nationally common reasons for hospital admission, there seems to be no other strong rationale at this point in choosing MCE topics. There is insufficient data to determine if topics are chosen to address perceived problems in care at the hospital level, or that the topics selected on the whole are adequately focused. There appears to be a bias in favor of choosing acute, rather than chronic conditions for examination. While the present PSRO practices for topic selection are consistent with the discovery of problem areas, the practices will have to be refined in the future to permit the continued

selection of high-impact topics and to insure that biases in the selection process do not leave areas of medical care unexamined.

Based on the analysis of 2,876 audits, deficiencies in the process of care are found in almost 70% of MCEs. The data indicate that almost all of the audits which detect such problems recommend corrective action. A review of a 10% random sample of studies begun in 1975 shows that most recommendations are implemented. Thus, though the program has no routine way of monitoring the implementation of corrective action, the fragmentary information available indicates that the frequency of such action is consistent with the widespread removal of problem areas in medical care. Not all initial audits which reveal deficiencies in care call for reaudits; in this sample only 43.5% of all initial audits required them. Only 132 of these reaudits however, have, been reported as complete. Thus, PSROs are not getting feedback on the work of their recommended actions. In order that the changes brought about in the quality of care can be assessed, reaudits will have to be carried out with greater regularity.

4.5 Profile Analysis and MCEs

The analysis of computer profiles which aggregate unit-record patient data in order that patterns of care can be observed, may become a powerful tool for the improvement of the health care system. As envisioned in the design of the PSRO program, profile analysis is a key component, guiding both concurrent review and medical care evaluation by pointing out problems of high priority. As the PSRO program has been implemented, however, profile analysis has been the last component to be put in place. The implementation of profile analysis is a complex task. Not only must a

profile system be designed, but arrangements must be made to carry out the practical details of abstracting and processing the data. To date, few PSROs have operational profiling systems.[1/]

Profiling can be especially significant to the development of the MCE component of the program. Properly applied, profile analysis can provide assistance to PSRO physicians by objectively identifying problems in their own hospitals and problems on a larger scale which might not otherwise be apparent. Where such systems exist they have generated topics for both areawide and individual hospital MCE studies.

4.6 PSROs and the Quality of Care

This evaluation has established that the MCE process, as implemented by PSROs and delegated hospitals, is an effective tool to detect and remedy problems in medical care in particular settings. It is another question, and one which this evaluation has only begun to address, whether the MCE program effectively fulfills the legal mandate to maintain the quality of the care provided to Federal beneficiaries. The study found that the growth in MCE implementation and the types of areas of medical care selected for study are both consonant with this goal, but the present study is not adequate to assess the quality of health care on a national scale. To do so will require the development of measures and an appropriate experimental design.

[1/] Mississippi and South Carolina PSROs have put unusually high priority on data systems, and have had operational profiling systems for some time. See Thomas Buntyn and Joanne G. Greer, "A Management Information System to Support Medical Peer Review," Proceedings of the Fifth Annual Conference of the Hospital Management Systems Society, American Hospital Association, Chicago, Illinois, February 1977.

5. SECONDARY EFFECTS

This evaluation is designed to address the primary questions about the PSRO program related to hospital utilization control, cost-containment, and quality assurance. Empirical evidence was gathered to these ends. In addition, the evaluation effort was augmented by numerous observations related to PSRO impacts which, while exceedingly difficult to quantify, seemed nonetheless real. Some of these developments were apparently foreseen in the design of the program, others may have been unanticipated. Some may be consonant with program goals, while others contradict them. In some cases their effect on cost or quality of care is not obvious. It is the purpose of this subsection to outline some of these less tangible effects of the PSRO program.

One comment almost universally encountered is the educational effect of PSRO on the physicians who take part in the peer review processes and on the medical community as a whole. The PSRO program calls upon health professionals to think and talk routinely about utilization, cost, and quality and to compare and question accepted practices. While this effect should not be overstated, it seems that professional self-regulation, to the extent it has existed in the past, has been carried out with a more limited view of professional responsibility, while PSRO encourages physicians to think peer review in the public interest. At the very least, such activities as CR, criteria development, medical care evaluation, and profile analysis engender a consciousness of the health care system as a whole, and not merely the individual's part in it, and thus, affect utilization decisions. Such educational effects may make the medical

profession more receptive not only to PSRO but to the necessity for other changes in the system.

There appears to have been a change in physician familiarity with concepts such as utilization review and medical care evaluation studies and a general willingness to consider and discuss peer review. A few medical schools are beginning to give courses in utilization review, cost-related issues, epidemiology, and medical care appraisal, thereby beginning to sensitize medical students to the cost and quality issues involved in medical practices.

Although PSROs are specifically physician organizations, the program has also necessitated increased conversation and cooperation between M.D.s and other health professionals, primarily D.O.s but also nurses and others. This increased interdisciplinary discussion of various aspects of the practice of medicine is felt by many to be invaluable to the advancement of patient care.

PSROs have brought physicians of similar and different specialties together to discuss and try to reach a consensus as to the appropriate treatment of disorders. Research has found that physicians generally tend to practice medicine as they were taught in medical school and according to their individual interpretations of their clinical experience. Even in those settings which are most conducive to mutual observation and communication, physicians actually have had limited, fragmentary knowledge of each other's practices.[1/] If, as it has been observed, medical care

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[1/] Freidson, Eliot, Profession of Medicine (New York: Dodd, Mead & Co., 1972), chapter 7.

includes equal proportions of science and of habit, the most significant accomplishment of the PSRO program in the long run may be to emphasize the scientific component of medical practice. While this positive effect may occur, in some instances criteria setting has not been done thoughtfully and available sets of medical care criteria have instead been accepted without critical consideration. Thus there is the possibility that local practices, unsubstantiated through clinical research, may be established as the standard, thereby missing the opportunity for advancement of the profession and stifling innovation in patient care.

PSROs apparently have affected certain other aspects of hospital medical practices. There is widespread feeling that review has improved the documentation of medical records. Though the rising incidence of medical malpractice litigation also has contributed to this improvement in record keeping, there is some sense that the existence of PSROs has given hospital medical records staff the leverage necessary to achieve improved record keeping by physicians, a problem of hospitals since the turn of the century. Also, the increased use of medical records as a result of CR and MCEs may be motivating physicians to record more thoroughly and thus increase the ability of the medical staff to judge the quality of work performed by its members. Peer review, formerly involved only in exceptional cases upon the complaint of a patient to a medical society, is now carried out as a routine matter. This may be at once both more effective and less threatening than the previous arrangement.

Some physicians have stated that the existence of PSRO has given them support in making utilization decisions which may be unpopular with patients or their families, such as the discharge of an elderly patient to a long-term care facility when the family wishes the patient to remain in the hospital. On the other hand, the PSRO program introduced a more complex rationale for determining the duration of health care benefits. Reasons for termination are not always made clear to the patients and their families.

The PSRO legislation has created a new set of regional institutions in the health care system, intermediate between the physicians and the Federal Government and interacting with practically every other type of organization involved in health care. With the ever greater involvement of the Government in health care financing, the establishment of two-way communication between the medical community and policy makers becomes increasingly important. Establishing a mechanism for communication is a major accomplishment. At the beginning of the 1970's it was not known whether the medical profession could be organized even to the point of performing regional review of medical care. The Experimental Medical Care Review Organization (EMCRO) research and demonstration program proved that such organization was feasible. The orientation of a regional peer review organization differs from that of medical and specialty societies, which represent both more diverse and more parochial physician interests. As a new and countervailing power base, PSROs may present opportunities for those physicians concerned with quality of care and utilization issues to exert their influence in a forum far larger than their own hospitals. The same may be said for a new type of health care administrator, the PSRO Executive Director.

Professional Standards Review Organizations have the potential to impact at the health care delivery system level through interaction with health planning agencies. The PSROs, unlike medical societies, have the interest, the experience, and the data to influence and assist other health-related organizations such as planning agencies, health departments and cost commissions, and to provide them with a medical perspective on the health care system. One particular area germane to PSRO Medicare review is the accumulation of evidence by the PSRO regarding the extent of need for modifications in nursing home practices regarding acceptance of certain types of patients and in many places the need for additional long-term care beds. Efforts to reduce long hospital stays among Medicare patients are futile if there are no alternative level of care beds available. It is felt by some that the existence of PSRO administrative structures has also facilitated other system changes, such as the implementation of "second opinion" programs legislated in some States.

The prospect of PSROs as system innovators may, however, be optimistic. Much depends on the degree to which they can mobilize the more consciencious physician to take part in the decision making process. The PSROs represent a potential source of political power; just as they may be forces for change, they may also constitute a holding action intended to legitimize current utilization practice and forestall more effective self-regulation in the public interest. The PSROs in their present early stage of implementation appear to be moving in the direction of introducing a greater cognizance of the public interest in the practice of medicine; their development as they mature and as the program is implemented across the nation will be of considerable interest.

6. COST STUDIES

6.1 Introduction

The cost component of the evaluation was conducted for the purpose of determining (1) the costs of the PSRO program, and (2) the costs of functions related to hospital utilization review which have been performed by Medicare intermediaries, Medicaid State agencies, and hospitals. The utilization review-related functions within these organizations, which include review activities and other associated activities, will ultimately be displaced or modified by PSRO review.[1/]

Cost data were compiled and documented to provide the basis for comparing PSRO review costs with pre-PSRO review models; to estimate the costs of the PSRO program under various policy options; and to estimate the incremental costs of PSRO review. These various estimates focus upon review models applied to acute hospital care only, and exclude other forms of institutional (e.g., long-term care) review and non-institutional care review.

The need for performing these cost studies stems from the fact that accounting and information reporting systems historically have not been designed to isolate hospital utilization review (UR) costs. In the case of hospitals, UR costs were often allocated to a "General and Overhead" accounting category. Reporting requirements for Medicare intermediaries and Medicaid State agencies do isolate, in a consistent fashion, the full set of UR-related costs incurred by these organizations. In the case of PSROs, changing policies with respect to funding delegated review activities created a need to estimate consistent cost data associated with this review option.

[1/] Examples of UR-related functions are activities performed by Medicare intermediaries to support and improve hospital (pre-PSRO) utilization review.

A series of four related cost studies were performed to achieve these objectives. These included studies to determine the costs of:

- PSRO Delegated Review,
- PSRO Non-Delegated Review and Administrative Functions,
- Medicare Fiscal Intermediary and Medicaid State Agency Utilization Review-Related Functions, and
- Hospital Utilization Review as Conducted Under the Original ("Old") and Revised ("New") Utilization Review Regulations.

The following section presents the cost data collection and the sampling design employed. The remaining sections describe results expressed in terms of estimates of unit costs, national aggregate costs, and incremental costs associated with the PSRO program.

6.2 Data Collection and Sample Design

All cost data were gathered through the use of primary data collection techniques. Generally, cost estimates for each of the review processes outlined above were developed from data gathered from historical accounting records and interviews in the field. Although specific techniques for collecting cost data varied by type of organization, the following general algorithm was applied in all cases: (1) review procedures and related functions were defined in detail and documented, and (2) criteria for allocating funds were developed to isolate the costs of these procedures.

These two steps were accomplished through structured interviews and discussions. In each case, the results of both steps were refined by cross-checking the results with other knowledgeable individuals in the organizations being surveyed. By applying cost allocation criteria to available financial

data of the organizations, a utilization review cost center was developed composed of reallocations of line item annual costs.

Studies of each of the primary organizations involved in UR-related activities (hospitals, Medicare intermediaries, Medicaid State agencies, and PSROs) were performed. Considerable effort was made to coordinate the site selection process and to maintain a geographically representative distribution among PSROs, intermediaries and State agencies. The sample sizes for these organizations are as follows; 16 Intermediaries, 13 State Agencies, and 12 PSROs.

Ninety hospitals were chosen on a stratified random sampling basis from the subset of PSROs with delegated review. Both delegated review and utilization review costs (reflecting procedures carried out according to the original "Old" UR regulations) were calculated for this sample. Another group of hospitals in non-PSRO areas was selected to gather costs associated with review procedures corresponding to revised "New" UR regulations. This group consisted of twenty-three hospitals drawn randomly from Nebraska and Louisiana (two of the four States still having virtually no PSRO activity at the time of the field survey).

Actual PSRO program administrative expenses were provided by the relevant governmental operating agencies.

The following sections contain the results of these studies viewed from both a unit cost perspective and a national aggregate perspective. The final section addresses the matter of incremental costs of the PSRO program, i.e., the costs of PSRO review (and related adjunct activities) over and above those of predecessor review programs.

6.3 Unit Cost Findings

This section presents individual sets of unit cost findings for (1) PSRO review (delegated and non-delegated); and (2) UR-related functions of Medicare intermediaries and Medicaid State agencies.

6.3.1 Unit Costs of PSRO Delegated and Nondelegated Review

The total cost of delegated review per discharge was determined to be $11.20. Components of this estimate include the costs of concurrent review (direct), preparation of the concurrent review abstracts, review committee time (and staff support), medical audits (MCE studies), and administrative costs directly associated with delegated review. Direct costs associated with delegated concurrent review were estimated at $7.23 per discharge, approximately 65% of the total costs. The cost of abstract preparation was estimated at $1.58 or 14% of total costs. Thus, the combined unit cost of delegated concurrent review and abstracting is estimated at $8.81.

The 90% confidence interval associated with this unit cost estimate ($11.20) was calculated at $+.77. With respect to economies of scale it was determined that if all Federal and non-Federal discharges were subject to delegated review the unit cost would drop to $8.31. This lower unit cost reflects a lower proportional rise in certain components of the total costs (e.g., review committee time) relative to increased numbers of reviews.

The average cost of performing a medical care evaluation study was found to be $209 (Federal portion). Annual costs of UR committee and direct administrative costs of delegated review were estimated at $1780 and $1589 respectively.

Total unit costs of delegated and nondelegated review were not compared because the implementation of nondelegated medical care evaluation studies were found to be very limited and would result in grossly underestimated total cost estimates for non-delegated review. With respect to the concurrent review component only, the unit costs for delegated review were found to be comparable to non-delegated review, $8.81 vs. $8.89 (these figures include the cost of abstracting).

The average annual operating costs for PSROs studied was found to be $366,900, the range of these operating costs being from $143,700 to $1,215,700. Stated in terms of units (discharges), operating costs were estimated at $7.11 per discharge. Approximately one-half of these costs were attributed to monitoring hospital activities.

All of the above cost estimates reflect the Federal portion of review costs and include total costs of physician time (based upon a rate of $25 per hour).

6.3.2 Unit Costs of Medicare Intermediary and Medicaid State Agency UR-Related Activity

Within these organizations UR-related costs were categorized into the following activities:

- Prospective Review
- Concurrent Review
- Retrospective Review

In addition to the actual conduct of review procedures, the costs of the following UR-related functions were estimated:

- Provider assessment and monitoring;
- Provider education.

The following results are stated in terms of these general cost categories. In instances where costs were not incurred, categories are omitted from the presentation. All unit costs in this section are stated in terms of costs per claim, rather than cost per discharge. For Medicare there are about 1.05 claims per discharge. Comparable information for Medicaid was not available.

- Medicare Intermediaries

The category identified by Medicare intermediaries where most costs were being incurred was retrospective review. This procedure consists of the review of claims for medical necessity and appropriateness prior to payment. This review is usually conducted as an additional aspect of claim processing. A three-stage review is customary--clerk review, nurse review of questioned claims, and if necessary, physician review.

Significant costs were also discovered in the provider assessment and monitoring category. These activities consist of routine, cyclical evaluations of provider UR programs and may be performed in conjunction with the intermediary's responsibility to administer the waiver of liability provision under the Medicare program.

- Provider education was the final cost area estimated. Educational training is conducted by intermediary personnel to assist providers in improving the UR process and the UR committee structure and impact.

Summary statistics are provided in Table 6.1.

TABLE 6.1

Utilization Review Costs from a Sample of 16 Medicare Intermediaries, 1976

Process	Average Cost per Inpatient Claim	Range of Cost per Inpatient Claim
Retrospective Review	$0.83	$0.24-1.70
Assessment and Monitoring	0.27	0.06-0.62
Provider Education	0.12	0.03-0.32
Weighted Average Total Cost	1.29	0.33-2.34

The range of these unit costs is considerable. The variation in costs may be partly attributed to variations in the intensity of the various activities at the studied intermediaries, as well as salary differences.

Based on these data, a national estimate of the cost of performing these UR-related activities was obtained by multiplying the average unit cost per acute inpatient claim by the annual national volume of acute inpatient claims. The estimate is $9,951,000. Upper and lower bounds (95% confidence) for this estimate are $9,600,000 and $10,300,000.

- Medicaid State Agencies

Retrospective review was the only activity studied at the Medicaid State agencies which was found to be in common with the review activities of Medicare intermediaries. Two additional review activities were conducted by Medicaid State agencies: prospective review and concurrent review.

- Prospective review consists of precertification or prior authorization to determine medical necessity before services are rendered.

- Concurrent Review is conducted during the hospital stay of the beneficiary and consists of admission certification and continued stay review (usually conducted in the provider setting).

Unit costs for these activities are summarized in Table 6.2.

TABLE 6.2

Utilization Review Costs from a Sample of 13 State Agencies, 1976

Process	Weighted Average Cost per Inpatient Review	Range of Cost per Inpatient Claim
Prospective Review	$5.03	$1.53-38.95
Concurrent Review	6.85	1.12-55.83
Retrospective Review	1.33	0.51-6.37

Unlike Medicare intermediary UR activities, which are guided by relatively uniform program instructions, the mode of Medicaid utilization review is left more to the discretion of individual States. The resulting variation is reflected in the wide range of unit costs of review.

Because of the variations found in the nature, scope and intensity of utilization review, estimation of national costs from the sample of 13 was not reasonable. Regional office and State agency personnel were queried about the State's review activities and estimated costs in the thirty-seven States not included in the sample. From these sources, national cost estimates were determined to be approximately $27,500,000 for 1976. No confidence interval was calculated for this figure, given the way in which it was constructed. Accordingly, this number is a gross estimate and should be used only as an aid in approximating the magnitude of expenditures involved.

6.4 Estimation of Total Review Costs for 1976 Under Four Policy Options

The results of applying computer simulation techniques to the problem of estimating Federal costs of the PSRO program and related hospital review costs (e.g., Medicare intermediary review costs) are described below. The "raw" unit cost estimates described in section 6.3 were used as input to the simulations. In addition, the actual administrative costs of central and regional Federal offices were used as input.

During the project, these Federal cost estimates were developed for the following PSRO coverage levels: (1) actual PSRO implementation status in 1976, (2) full (nationwide) implementation for Federal - Medicare and Medicaid - beneficiaries, (3) full implementation for all Federal and non-Federal patients, and (4) 20% targeted review for Federal patients.[1/] A range of costs associated with choosing various levels of hospital delegation is presented.

It should be called to the reader's attention that, as of this writing, option four, above (Targeted Review), is official DHEW policy.[1/]

6.4.1 Cost Estimating Techniques

Cost components comprising the national estimates were computed as follows:

- Delegated Hospital Costs were estimated by using a set of multivariate cost estimation models. Characteristics of all U.S. short-term hospitals as available on the 1975 Master Facility Inventory tape were used to define hospital clusters. The survey hospitals from which data was sampled were then assigned to clusters using the derived clustering rules, and cost estimating equations were calculated within each of these clusters. National estimates were then built up by extrapolating cost, estimating results for all the other hospitals in the country, cluster by cluster.

[1/] 20% was chosen for purposes of illustration only.

- Non-Delegated Review Costs were estimated by using a weighted average of non-delegated hospital unit review costs multiplied by the number of non-delegated discharges.

- PSRO Level Costs were developed by multiplying a weighted average unit cost figure by the total number of Federal discharges subject to PSRO review. Both the non-delegated review costs and the PSRO level costs were estimated from on-site, cost-finding and cost-building interviews at 12 PSROs.

- Medicare Intermediary and Medicaid State Agency Costs were estimated by applying their respective unit costs for review (as presented in section 6.3.2) to all Medicare and Medicaid discharges (based upon 1976 annual estimates). This estimate was used in computing Federal review costs under nationwide program implementation as applied to Medicare and Medicaid beneficiaries only (option 2).

- Monitoring Costs as applied to estimating review costs of review for all patients (option 3) were computed by applying the unit cost associated with Medicare intermediary 20% monitoring to Federal and non-Federal discharges.

- Governmental Administrative Costs used under option 1 are actual 1976 incurred costs. These costs were increased by 5% and 10%, respectively, for options 2 and 3.

6.4.2 Results

The results in Table 6.3 show the estimated costs of PSRO peer review in 1976 for four levels of program operation generated by computer

simulation model. The first column defines the level of operation being costed. The second column includes the number of hospital discharges under review relevant to the cost estimate. If all hospital discharges were covered by peer review, then the program coverage would expand by over eight-fold from current levels. Columns 3 through 9 give individual component costs for each assumed operating level. Column 10 gives the total cost (in thousands) of (1) $122.3M for current operating level, (2) $275.0M for full PSRO implementation of Federal beneficiaries, (3) $685.6M for full PSRO coverage of all hospital patients, and (4) $184.0M for a 20% focused review.

Costs do not increase at the same rate of increase as total discharges. The average total program costs per discharge figures (found by dividing total discharges covered into total costs) gives the following average total cost per discharge figures: (a) $30.22 for 1976 actual program, (b) $22.57 for fully implemented program for Federal beneficiaries, (c) $19.19 for fully implemented program covering Federal and non-Federal patients, and (d) $15.10 for current targeted review policy. This is to say that economies of scale are evident.

Sensitivity analyses were conducted by varying the percent of delegated hospitals utilized in the analysis. The simulation results show that this factor has little impact on total estimated costs. If 36% of hospital admissions were under delegated review, the estimated costs of a program covering all Federal beneficiaries would be $263,535,000 while the comparable figure for 85% delegated review would be $276,866,000, about 5% difference. Equivalent estimates for a PSRO program covering all hospital patients, results in figures of $673,532,000 and $688,440,000 respectively.

TABLE 6.3: SIMULATION MODEL ESTIMATES OF FEDERAL AND STATE REVIEW COSTS FOR (1) 1976 INCURRED COSTS; (2) 1976 INCURRED COSTS WITH FULL IMPLEMENTATION; (3) 1976 INCURRED COSTS WITH ALL PATIENT PEER REVIEW; and (4) 1976 INCURRED COSTS WITH 20% FOCUSED REVIEW FOR FEDERAL PATIENTS
($ IN THOUSANDS)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
			COST COMPONENT						
Cost Estimate Assumptions	Total Discharges (000's)	Delegated[1] Hospital Costs	Non-[1] Delegated Costs	PSRO Costs	Sub Total	Medicare Inter-mediary	Medicaid State Agency	HSQB/ HCFA	Total
1. 1976 Incurred Costs	4,045	$ 36,138	$13,230	$32,241	$81,609	$ 9,337[2]	$27,010[2]	$4,300	$122,256
2. 1976 Incurred Costs with Full PSRO Implementation	12,188	$130,079	$23,359	$97,141	$250,579	$ 9,337	$10,558	$4,520	$274,994[3]
3. 1976 Incurred Costs with Full PSRO Implementation Including Non-Federal Patients	35,723	$292,385	$64,705	$284,715	$641,805	$39,012	--	$4,730	$685,547[3]
4. As in "2" above but 20% Targeted Review	12,188	$ 54,300	$10,200	$95,100	$159,600	$ 9,337	$10,558	$4,520	$184,015

[1] Based upon 68% delegated hospital status (actual 1976 level).

[2] These figures are slightly different from those presented in section 6.3 because the assumption for the numbers of Federal discharges used in the simulation was slightly different than that used in section 6.3.

[3] The numbers $274,994 and $685,547 are inconsistent with those presented earlier as aggregate program costs ($268.5M and $689.9M). The latter numbers exclude Medicare intermediary and Medicaid State Agency UR related expenditures but include an adjustment for physician donated time.

6.5 Incremental Costs of PSRO Compared with Pre-PSRO

6.5.1 Definitions

A secondary objective of the evaluation cost analysis was to determine the incremental costs of PSRO over alternatives. The concept of incremental costs refers to a national estimate of the difference between costs of operating a PSRO-based review system (including both PSRO costs and monitoring costs) and baseline costs. This general relationship can be stated in terms of the following expression: Incremental costs = [PSRO costs + Monitoring Costs] - Baseline Costs.

Baseline costs refer to outlays for utilization review and related activities which might be expended, or which were expended in the past, in lieu of a PSRO based review system. "Monitoring costs" primarily include those ancitipated dollar outlays associated with residual (post-payment) claims screening activities of Medicare intermediaries and Medicaid State agencies under post-PSRO conditions.

The calculation of incremental costs is based on the assumption that if the PSRO statute had not been enacted, some form of hospital utilization control mechanism would continue to be funded by the Government. The true opportunity cost of the PSRO program is thus its incremental cost, rather than the total program cost.

6.5.2 Assumptions

Factors which affect incremental cost estimates include:

- Medicare intermediary and Medicaid State agency activities: It was assumed that current Medicaid State agency prospective and concurrent review programs will continue. (PSRO incremental costs will decrease as these

programs are phased out.) Also assumed to continue are the existing monitoring activities for both the Medicare intermediaries and Medicaid State agencies (currently 20% of claims are subjected to UR screening).[1/]

The evaluation in effect assumes that the current (post-PSRO) costs of Medicare intermediary monitoring do not differ significantly from prior review costs. This result follows, in part, from the assumption that 20% post-payment monitoring of PSRO review by intermediaries will continue. The reasons are that the majority of current costs for retrospective review are incurred at the second and third levels of review, conducted by registered nurses and physicians, and approximately the same number of claims, twenty percent, enter the second level of review as is required for the twenty percent PSRO post-payment monitoring process. Savings may be experienced in the elimination of the first level of review, the screens for identification of claims for further review, but these savings would probably be offset to some extent by the greater physician involvement required for PSRO monitoring and by the costs of communicating the results of monitoring to the PSRO. Medicaid monitoring expenditures are difficult to estimate given the individual discretion of the States. Therefore, the amount estimated for monitoring after PSRO implementation is the 1976 amount minus that incurred for concurrent review.

- The long-run configuration of the PSRO program: A national program is assumed that approximates those PSRO areas in active States as regards the

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[1/] The reader should note that the continued UR expenditures associated with Medicare and Medicaid are estimated to be approximately $37 million. This estimate is about 13% of the total estimated cost of full PSRO implementation for Federal patients.

current proportional configuration of delegated and nondelegated hospitals etc. Anticipating that some degree of targeting may take place with respect to PSRO concurrent review (i.e., applying concurrent review to a sample of hospital episodes), incremental costs were calculated given this option, as well. To examine the possible cost implications of targeted review, it was assumed that concurrent review would be limited to a twenty percent selected sample of hospital episodes.

- The baseline assumptions: Unlike the other assumptions underlying baseline costs, the type of utilization review hospitals would have undertaken in lieu of PSRO review is not clear. Thus, in order to account for this ambiguity the evaluation assumes: (1) continuation of procedures under the original ("Old UR") regulations, or, alternatively, (2) implementation of the revised ("New UR") regulations. Thus two estimates of incremental costs are calculated: one based on "Old UR," the other based on "New UR."

Remaining assumptions include:

- current Federal reimbursement guidelines remain in effect;
- sixty-eight percent of Federal discharges would be subject to delegated review and the remaining thirty-two percent to nondelegated review;
- physicians would be reimbursed for ninety percent of their claimable time spent on PSRO review on the average of $25 per hour;
- provider monitoring and assessment, and provider educational activities would be eliminated from Medicare and Medicaid activities.

6.5.3 Results

Table 6.4 illustrates the computation of annualized national incremental costs of a fully implemented (100% review) PSRO program for Medicare and Medicaid patients given the above procedures and assuming 100% concurrent review. The calculated incremental costs of PSRO are thus $187.2M over "Old UR" and $161M over "New UR".

If it is assumed that PSRO concurrent review is performed on a 20% selected sample of Medicare and Medicaid patient hospital episodes the gross national estimate of the PSRO program is reduced by approximately 31% to $184 million. Using this estimate the incremental costs of the PSRO program are altered to $76.4 million and $102.7 million given the baseline cost assumptions of "Old" and "New" UR, respectively.

If it is assumed that PSROs eventually negotiate Memoranda of Understanding with all State Medicaid Agencies, all duplicative state-run concurrent review would than be eliminated from the monitoring estimate. This would result in a lower incremental cost for PSRO.

Table 6.4

PSRO INCREMENTAL COSTS (MILLIONS OF DOLLARS)[1]
For 100% Review of Federal Patients[2]

Baseline Costs under "Old UR"[3]			
Hospital Utilization Review		$ 81.3	($67.5, $95)
Medicare Intermediary Review		10.5	(10.1, 10.9)
Medicaid State Agency Review		25.5[4]	
	Total	$117.3	
Baseline Costs under "New UR"			
Hospital Utilization Review		$107.6[5]	
Medicare Intermediary Review		10.5	(10.1, 10.9)
Medicaid State Agency Review		25.5[3]	
	Total	$143.6	
PSRO Review Costs			
PSRO		$268.5[6]	($220, 316.5)
Monitoring		36.0	
	Total	$304.5	
PSRO Incremental[6] Cost over "Old UR"		$187.2	
PSRO Incremental[6] Cost over "New UR"		$160.9	

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[1] All cost data are stated in 1976 cost levels.

[2] For 20% Targeted Review, PSRO Costs would decrease by approximately 31%. See preceeding page.

[3] "Old UR" = pre-1974 Social Security Administration regulations
"New UR" = post-1974 Social Security Administration regulations.

[4] No confidence interval is available for this number because the methods used for estimation varied from State to State.

[5] Sample size insufficient to compute a meaningful range.

[6] All of the above calculations are based on 1976. During 1976 Medicaid State agencies conducted about $16M worth of concurrent review. In later years, after Memoranda of Understanding are executed between all Medicaid State agencies and their respective PSROs, Medicaid concurrent review activities included in the monitoring estimate should appraoch zero. At this point in time the incremental cost of PSRO would be at least $16M lower.

7. PROGRAM POTENTIAL: A COST BENEFIT-FRAMEWORK

7.1 Introduction

This section discusses the PSRO program cost-benefit framework from a limited perspective. Although the costs of the program can be estimated with some degree of reliability, assessment of the full range of magnitude of potential benefits from the PSRO program is beyond the scope of this evaluation. Rather, the issue addressed is the more limited question of whether the primary effects of the PSRO program on acute Medicare hospital utilization are sufficient to return dollar savings to affected Federal and State health programs which exceed the incremental costs of operating the PSRO program.[1/] The potential of the PSRO program to act as a cost-containment mechanism will also be addressed in the context of its primary direct cost-effectiveness in reducing the utilization of inpatient care services to Medicare patients. Medicare data was used because this is the only data base adequate to support the calculation of the rates required to estimate population based program benefits.

While the program's potential to affect a wide variety of changes in the health care sector has been suggested, the view taken in this study is that it is not feasible to evaluate the present or cumulative future net economic benefit of all the possible effects of the PSRO (e.g., health care service quality, national health status, economic productivity, capital commitments to resource development, institutional relationships, and overall health care utilization). In the first place, the PSRO is but one of many factors

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1/ See section 6.4 for a discussion of incremental costs. The incremental costs used in this section are the PSRO costs minus the "new" utilization review costs.

affecting a very complex health system. In the second place, even if it were possible to separately identify the PSRO's contributions in the context of these other influences, placing a dollar value on such end results as health status and future returns from current capitalization would be a difficult task. Finally, since the program is still relatively new it is premature to examine long range benefits. This section also explores the possibility that "days saved" are used in alternative settings such as SNFs, home health care, etc. Thus, rather than attempt a complete cost-benefit analysis, the quantitative analysis is limited to the primary savings from utilization control. Other potentially major effects of PSRO on the health care system have been presented and assessed qualitatively in previous sections.[1/]

7.2 Benefit-Cost Methodology

Because the analysis of PSRO impact on Medicare hospital utilization indicated no statistically significant overall benefits in the form of "days saved" (from a reduction in utilization rates) associated with introduction of PSRO review, this section addresses the issue of the PSRO program's potential to achieve cost-effectiveness. This has been accomplished by calculating "break even" points for each of the active PSRO areas utilized in the Medicare analysis. "Break even" points were calculated by estimating the number of "days saved" required to recover PSRO program incremental costs. "Days saved" are valued by estimating the short-term reduction in Medicare Part A expenditures associated with reduced utilization of Medicare patients.

1/ The reader should note that all the comments that pertain to the Medicare analysis also apply to this cost-benefit section. For example, extrapolation to national estimates is not warranted.

The intent of such an analysis is to provide a perspective on the extent of PSRO utilization reduction necessary for PSROs to cover their operating costs and the degree to which utilization must be reduced before cost-containment is achieved.

7.2.1 Calculation of Benefits: The Valuation of Days Saved

It was not possible to directly calculate the PSRO effects on actual Part A Medicare expenditures. Rather, high and low estimates of the dollar value of a day of hospital care saved were computed from HCFA data on audited per diem charges for routine and ancillary services.

To estimate the value of a day saved in terms of routine charges, it was assumed that total hospital expenditures remain unchanged in the face of a small decrease in Medicare days of care and are reapportioned under the Medicare cost reimbursement formula.[1/] In nontechnical terms, this is equivalent to the hospital's recovering the lost revenue from one day less of Medicare use by apportioning the routine per diem for that day among other payors in proportion to their use of the facility. The amount added to the non-Medicare patients' bills is the amount "saved" by Medicare.

[1/] Cost reimbursement policies virtually guarantee this result since hospital administrators have, the largest financial incentive to reduce labor inputs, (which are the largest expense of hospitals.) The Cost of Living Council based its hospital regulations on the assumption that 40% of average expenditures were variable. Similar results were obtained in the OPEL evaluation using a different approach. The value of a day saved ranged from 34% to 48% of the per diem; including a 50% savings in ancillary per diems, raised the value to 52.9% of the per diem. However, it should be noted that "the proportion of hospital costs which vary with occupancy is not known and needs further study" (Institute of Medicine, Assessing Quality of Health Care: An Evaluation, November 1976, p. 61).

Ancillary service charges were dealt with differently. Here a range of savings was calculated by assuming alternatively either a zero or 50% savings in ancillary per diems.[1/] The sum of savings attributable to (1) routine per diem charges and (2) ancillary per diems is the value of a day saved.[2/]

Implicit in the calculation of the value of a day saved are the assumptions that a hospital's total expenditure for inputs to rountine services would not vary with small changes in occupancy (use rates) and that hospitals attempt to reach "target incomes." However, if large reductions in use were forced on a hospital, it seems likely that controllable expenditures, such as for consumable inputs and labor, would be reduced and larger short-term savings than those estimated would occur. The amount of savings from a small reduction in utilization also varies with the distribution of PSRO utilization effects. If concentrated in a small proportion of hospitals, then reductions in hospital expenditures are more likely to be larger than estimated.

The extent of PSRO effects on non-Medicare utilization will also affect Medicare program savings. The Medicare cost reimbursement formula apportions hospital expenses between Medicare and non-Medicare patients in proportion to their use of hospital days. If non-Medicare utilization is reduced in

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[1/] Empirical data on the relationship of ancillary service reimbursements to reduced admissions or lengths of stay were not available. However, it is evident that the intensity of ancillary services decreases substantially at the end of a stay. Thus, shortening the length of hospitalization is seen as producing little savings in ancillary services. Likewise, admission rate reductions achieved from shifting necessary care to more appropriate settings (e.g., substitution of "in and out" surgery) would seem to produce little, if any, reductions in ancillary reimbursement.

[2/] The reimbursement reduction from a day saved is, at the margin, identical to the reimbursement increase from a day added.

concert with PSRO associated drops in Medicare utilization, then Medicare savings are smaller.

No attempt was made to estimate the value of potential PSRO effects on quality, changes in product mix, substitutions of care to more appropriate sites, spill-over effects on the non-Medicare population, services reimbursed under Medicare Part B, or long-term changes such as in the availability and unit prices of health services and facilities, health status and national economic productivity. It should be noted that to the extent PSRO review is responsible for moving patients to more appropriate settings, such as long-term facilities and ambulatory sites, additional expenditures are incurred. Thus, the results below tend to overstate the short-range direct expenditure reductions due to PSRO. On the other hand, to the extent that PSRO induced reductions in hospital occupancy enable marketplace and planning agency actions to reduce the supply of hospital beds and retard unit price inflation, over the long run there may be larger benefits associated with the PSRO program's control of utilization.

7.2.2 Calculation of PSRO Incremental Costs

The PSRO incremental costs for Medicare review were estimated for individual PSRO areas using the hospital cost data referenced in section 6.3[1/] Incremental PSRO review costs are defined as the sum of the estimated PSRO administrative costs for operation, the cost of amortizing all start-up expenses over ten years at 8% interest, and the excess of PSRO hospital concurrent review cost over the cost of hospital "new" utilization review for

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[1/] The cost of MCEs has been included in the review costs because of the potential of these studies to contribute to more effective patient management, correction of administration delays, and modification of criteria.

1976. Because study cost data represented both Medicare and Medicaid patient review, the incremental cost for Medicare review was determined according to the proportions of Medicare and Medicaid admissions.

7.2.3 Calculation of PSRO "Break Even" Points

The "break even" point is defined as the point when the benefits procuced from reduced utilization equal the incremental cost of PSRO review. At this point the benefit-cost ratio is 1:1 and since the program just pays for itself, the net effect on expenditures is zero. To compute the "break even" point, the PSRO cost was divided by the dollar value of a day saved. This gave the total number of days which the PSRO would have to save in order to break even. The number of days was then divided by the number of Medicare enrollees (in 1,000s) to arrive at the proportionate reduction in the utilization rate needed for the PSRO to break even.

It should be noted that, due to the unavailability of any reasonable methodology, no attempt was made to quantify the benefits of the MCE component of PSRO operations beyond those reflected in gross utilization (days of care). Thus the resulting ratios probably underestimate PSRO benefits.

7.2.4 Calculation of Individual PSRO Utilization "Savings" (Disaggregated Analysis)

The disaggregated analysis of Medicare utilization presented in Section 3.2 was accomplished by comparison of the 1974-1976 utilization changes between each of the 18 PSROs studied and its matched comparison (nonactive) area(s). In this analysis it was assumed that, all other things being equal, the active PSRO area utilization rate would change by the same rate as the comparison area. The 1976 "expected" days of care per

1,000 was projected for each of the 18 PSROs by multiplying the PSROs 1974 (pre-PSRO) utilization rate by the ratio of the 1976:1974 rates in the comparison area. Any difference between the 1976 actual rate and the expected rate is herein assumed to be a result of the PSRO program.

The disaggregated analysis can be misleading if one attempts to attribute absolute causality; i.e., that PSRO alone caused the changes. While the areas were matched as well as possible, there is always the possibility that some other factor which has not been measured or controlled may be the causal factor. Theoretically, this type of disaggregated benefit-cost analysis can only grossly estimate PSRO impact, and incorrectly imputes random noise in the data to program effect. However, the eighteen benefit:cost ratios together do appear to reinforce the aggregate finding of no overall benefit:cost, at least as of the end of 1976.[1/] The reader is referred to Table 7.1 for a summary.

Savings in utilization occur when the actual days per 1,000 are less than the projected rate; losses occur when the actual rate is higher. The results presented in this section were obtained by combining the semi-annual results of the disaggregated Medicare rate analysis as presented in Section 3.2.4.

7.2.5 Calculation of Benefit Cost Ratios

The benefit:cost ratio expresses the relationship between the economic value of utilization changes associated with introducing PSRO review and the

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[1/] However, the authors must reiterate that the aggregate results relate only to the universe studied and findings should not be extrapolated to the entire country.

costs of PSRO review. Note that both the benefits and costs are incremental (or marginal), since they have been derived from comparisons to utilization and costs under "new" utilization review.

Thus, the benefit:cost ratio indicates whether or not additional benefits are generated by shifting from UR to PSRO review and whether the benefits equal or exceed the additional costs added to the system from introducing PSRO. Benefit:cost ratios greater than 1:1 mean benefits exceed costs added to the system and net expenditure reductions occur. Ratios between 0:1 and 1:1 occur when benefits from reduced utilization are less than costs and indicate that the added costs of PSRO are not recovered. Negative ratios occur when actual days of care per 1,000 exceed the expected number. In this case, the computations imply that the PSRO may be adding to expenditures for care as well as causing expenditures for review.

Benefit:cost ratios were computed for the individual PSROs by dividing their estimated utilization savings per 1,000 (or losses) by the break-even point in days per 1,000. This is mathematically equivalent to multiplying the savings per 1,000 (or losses) by the number of enrollees and the dollar value of a day saved (which given dollar savings or losses) and then dividing by the PSRO cost.

7.3 Results

7.3.1 Break even Points

Table 7.1 shows the low estimate "break-even" points for reductions in the utilization rate. These ranged from 26.2 (1.2%) to 129.8 (3.9%) days

of care per 1,000. Variations are due to differences in cost of PSRO operations, hospital per diems, and Medicare patient proportions in the area. The lower estimated value of a day saved, based on no reduction in ancillary per diems, gave "break-even" points about 30% higher.

The weighted means for the low and high "break-even" points were 56.7 (1.6%) and 72.7 (2.05%) reductions in days of care per 1,000. Therefore, on the average the PSRO program will have to reduce utilization (days of care/1,000) from between 1.6% to 2.1% in order to cover its incremental costs. These computations are based on the program as it actually existed in 1976, i.e., 100% review of Federal patients.

A targeted review program, such as that now being implemented in 1978, would have a more favorable cost-benefit ratio. Under this option, break-even is estimated to be at least 14 percent lower, requiring a reduction in days per 1000 of only 0.9 to 1.2% to offset program expenses.

7.3.2 Days Saved

The 1976 actual and "expected" utilization rates for each of the 18 PSROs, as well as their "savings" (reductions) or "losses" (increases) in utilization are shown in columns (3)-(5) of Table 7.1. Seven of the 18 active PSROs studied showed relative reductions (savings) in utilization rates while 11 active PSROs showed increases in utilization relative to their comparison PSRO areas. The mean "savings" for all 18 PSROs, weighted by enrollees, is a reduction of 20.3 days per 1,000. Thus, the sum of days "saved" by the seven PSROs with associated decreases exceeded the losses in the other 11. Relative to the weighted expected utilization for the 18, this represents a reduction of 0.6% in days per 1,000. This figure

implies that when the results of pairwise computations are combined the PSRO program might be attributed with a saving @.6% of the days of care per 1,000. These results are unadjusted for variation in base rates and unadjusted for demographic characteristics which correlate with utilization. See the discussion of the Medicare data base analysis for a complete explanation of PSRO overall impact on days of care per 1,000 and associated significance tests. Because it violates reasonable statistical assumptions the study team does not attach much credibility to this summation of individual pairwise computations. These data are provided primarily for comparative PSRO-by-PSRO inspection.

7.4 Cost-Containment Potential

If PSROs are able to generate dollar savings for the Medicare program through utilization reduction beyond the "break-even" point (benefit-cost ratio = 1:1), then they will be able to contribute to cost-containment objectives. The PSRO incremental cost equals about 0.98% of the estimated Medicare Part A reimbursements in the 18 areas studied. Given the relationships between per diems and the value of a day saved it can be shown that each one percent reduction in the utilization rate beyond the break-even point produces a decrease on the order of 0.5 - 0.6% in Medicare Part A reimbursement.[1/] In relation to the 15.5% increase in hospital expenditures per patient day observed in 1976, PSROs would have to exercise a very strong effect on utilization to fully contain inflation in hospital costs.[2/] As indicated, PSROs in aggregate did not produce even the small reductions

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[1/] Since the value of a day saved is predicated on small utilization changes, the rate of savings shown would underestimate the value of large utilization reductions. Extensions of the estimate beyond a Medicare utilization decrease of 15-20% are inappropriate.

[2/] Council on Wage and Price Stability, Executive Office of the President, The Rapid Rise of Hospital Costs, (January, 1977, p. 9.)

(1.6 to 2.05 percent) needed to "break-even." Since it is not clear that utilization reductions of large magnitude are warranted from a patient management point of view, it seems evident that short-term direct expenditure savings potentially realizable through PSRO controls on utilization cannot overcome competing inflationary pressures on hospital expenditures. However, to the extent that other cost-containment strategies (cost commissions, HSA, etc.) can build upon PSRO achievements in utilization reductions by reducing the expenditure burden of supporting underutilized resources, then greater expenditure reductions would likely occur. PSROs would then make a valuable contribution by creating pressures on the planning bodies to implement other cost-containment strategies.

If targeted review had been implemented in 1976, the study estimates suggest cost savings in the order of 36%.[1/] These reduced program costs imply that under conditions of targeted review the program could pay for itself if it achieved and maintained reductions in utilization rates on the order of 0.65% to 0.83%.

[1/] This differs from the 31% figure given in the incremental cost section because the break-even analysis did not include HSQB expenditures or Medicare Fiscal Intermediary expenditures.

TABLE 7.1
BENEFIT-COST ANALYSIS FOR 18 PSROs (1976)

PSRO AREA	(1) Low Estimated "Break Even" Point (in days "saved" per 1,000) 1/		(2) Dollar Value of a Day "saved" 2/	(3) 1976 PSRO UTILIZATION RATE (TOTAL DAYS PER 1,000 ELIGIBLES)			(6) BENEFIT-COST RATIO 4/
				ACTUAL	EXPECTED 3/	"Savings"(+) or "Losses"(-)	
Census Region	No.	% of Expected					
A	26.2	(1.2)	$79.49	2113.4	1951.7	-161.7	*
B	35.3	(1.4)	94.84	2531.8	2452.4	- 79.4	*
C	45.0	(2.1)	81.33	2249.7	2145.6	-104.1	*
D	129.8	(3.8)	49.52	3334.1	3460.3	+126.2	0.97:1
E	68.9	(2.5)	68.95	2812.2	2743.3	- 68.9	*
F	65.3	(1.6)	70.22	3515.6	4002.9	+487.3	7.5:1
G	52.4	(2.2)	67.76	2459.6	2354.7	-104.9	*
H	83.4	(2.3)	46.19	3017.9	3551.9	+534.0	6.4:1
I	54.4	(1.2)	88.44	5108.3	4618.1	-490.2	*
J	37.3	(1.3)	78.31	2999.9	2892.2	-107.7	*
K	39.1	(1.4)	63.47	2893.2	2836.9	- 56.3	*
L	63.9	(1.5)	37.36	4214.6	4339.3	+124.7	2.0:1
M	50.3	(1.6)	43.23	3140.6	3096.1	- 44.5	*
N	56.9	(1.3)	56.20	3805.3	4259.4	+454.1	8.0:1
O	33.8	(0.7)	72.71	4807.3	4729.6	- 77.7	*
P	31.6	(0.8)	59.99	3975.6	4171.2	+195.6	6.2:1
Q	58.2	(1.6)	68.84	3785.6	3613.8	-171.8	*
R	65.9	(1.8)	54.07	3472.1	3611.5	+139.4	2.1:1
Weighted Mean	56.4	(1.6)	$59.64	3507.1	3527.4	+ 20.3	-0.08:1

1/ Low estimate of the reduction in days of care per 1,000 necessary to cover PSRO incremental costs is based on high estimated value of a day "saved."

2/ The high estimate; based on valuing ancillary service savings at 50% of the average per diem plus computed routine service savings.

3/ Based on projection of 1974 utilization rate for PSRO using the percent change for matched comparison areas from 1974 to 1976.

4/ Individual PSRO benefit-cost ratios less than zero are indicated by an asterisk (*). The weighted mean for all 18 PSROs is less than zero inspite of a weighted mean "savings" because the value of a day saved is smaller for the PSROs with utilization reductions than for the PSROs with increases.

8. DIRECTIONS FOR FUTURE PSRO EVALUATION EFFORTS: ISSUES AND RESEARCH PROBLEMS

Introduction

A number of evaluation issues could not be addressed in the present evaluation. However, it is assumed that, given the importance of the quality assurance program, additional studies will be undertaken in the future.

Several specific studies described below, if conducted, might expand and supplement the findings of the current evaluation. The list is far from exhaustive, but it does suggest some of the priority areas amenable to evaluation based on the experience of the present evaluation in obtaining and using relevant data.[1/] Given this present study's finding that the quantifiable effects of PSRO thus far are below the levels necessary for the program to be self-supporting in dollar savings, future studies should not only address basic evaluation issues of the program's effects but also examine alternative approaches to conducting types of review that may be more cost-effective.

- Issue #1: PSRO Review Impact on Medicare Hospital Utilization Rates

This study would be an expansion of the Medicare utilization analysis conducted in the present evaluation but strengthened with an additional year of data on existing PSROs. In addition, data for new PSROs which started review during 1976 would be utilized.

[1/] A more extensive list of issues is developed in Martin Baum, Peter McMenamin, and Melvin Rudov, Program Evaluation Plan: Professional Standards Review Organizations, DHEW, 1975.

The methodologies employed in such an evaluation would have to be modified in one important aspect. As more PSROs become active, fewer comparison areas will be available.[1/] Thus the type of comparative analyses used in this evaluation becomes less feasible. More attention, therefore, will have to be focused on longitudinal analyses (the time PSRO areas have been active) and to relative comparisons (the comparison of relative performances of different types of PSROs).

The evaluation reported in these volumes, of necessity, regarded the experimental treatment as a unidimensional entity, the presence or absence of PSRO. Yet it is inherent in the program design, and supported in the findings of the case studies, that PSROs differ in ways which may lead to differential effects on the cost and quality of medical care. In the interest of refining the analysis and in anticipation of the disappearance of comparison areas within the United States, the next evaluation should develop ways of measuring the characteristics of the review process and subsequently determining the relative impacts of differently configured PSROs. Thus, the study would not only compare average PSRO review to average UR in the absence of PSRO, but also compare various types and levels of review effort. For instance, such aspects of review frequency, application of explicit or implicit criteria, degree of PSRO supervision of review, degree of delegation, and use of profile or other retrospective review analyses could be explored.

[1/] Some comparison areas will still exist in 1977, but by law PSRO review in acute care hospitals will soon be fully implemented.

The developmental characteristics of the PSRO program should also be explored. It is often contended that PSROs are complex institutions imposed on even more complex systems. This being the case, it is argued that PSRO impact will not come easily or soon. Experience of some of the early PSROs suggests the opposite, at least with respect to utilization rates: early impact followed by smaller relative effects. A careful investigation should be made of this issue.

- Issue #2: PSRO Review Impact on Medicaid Hospital Utilization Rates

This study would use many of the methodologies developed for the current evaluation but applied to Medicaid data. While such data were not available for the present evaluation, several States will soon have data which will support rate analysis.

The most difficult aspect of Medicaid rate analysis is reliable counts of eligibles for given time periods. Medicaid eligibility regulations change both over time and from State to State. As a result, the composition and utilization behavior of the Medicaid population changes frequently. Work done by Dr. Robert Brook and others, however, suggests that these methodological problems can be overcome. This issue should be a high priority for any future PSRO evaluation efforts.

- Issue #3: PSRO Impact on Quality of Care

The evidence presented in this report suggests that PSROs have considerable potential to effect significant improvements in the care process. This is, however, only the first step in the evaluation of this aspect of the program.

Further studies would begin to examine with greater precision the influence of PSRO - primarily the MCE component - on the processes and outcomes of care. What is needed is the development of an evaluation framework which specifies the variables to be observed and the measures and criteria for judging impact on process and outcome. Comparison of these measures before and after treatment and in PSRO and non-PSRO areas would enable policy makers to judge the effectiveness and cost-effectiveness of MCEs.

The impact of MCEs on the process of care can be assessed in part from data contained in the PMIS. Assuming that MCE reaudits will be carried out and reported with greater regularity, future evaluations will be able to measure the degree to which various deficiencies in care have been removed. If the number of reaudits remains inadequate, an independent study utilizing reauditing may need to be carried out. Refinement in measurements of the MCE process itself, including costs, levels of manpower, types of criteria, and degree of PSRO supervision and assistance may make it possible to relate in some fashion the level of effort expended to the degree of improvement achieved in the process of care.

The next level of evaluation would be to examine the effect of MCE studies on the outcomes of care. This does not mean global measures of patient health status, but, rather, such specific proximate outcomes of care such as surgical complication rates, nosocomial infections, and diagnosis or procedure-specific mortality rates. Work has already begun to develop lists of such preventable events for use as outcome criteria of the quality of care.[1/]

[1/] Rutstein, David, et al., "Measuring the Quality of Medical Care: A Clinical Method", New England Journal of Medicine, 294 (March 11, 1976), pp. 582-588.

- Issue #4. PSRO-Induced Changes in Hospital Case Mix Severity and Treatment Patterns

A suggestive, but far from clear, finding of this evaluation was a small increase in case mix severity, as measured by SysteMetrics, Inc.'s "staging methodology, associated with PSRO review.[1/] The finding is subject to question on three bases: (1) the change observed could be an artifact of known changes in diagnostic and coding practices, (2) the change could be caused by differences over time in the composition and epidemiology of Medicare and Medicaid eligible populations, and (3) the change could be due to the particular application of the staging methodology employed in this evaluation. If this tentative finding of impact were maintained by further research, it would demonstrate that PSRO review results in more appropriate use of hospitals.

Since validation of the case mix severity results reported in this evaluation would require detailed analysis of patient records, and preferably ambulatory care records as well, additional evaluation questions could also be addressed. The PSRO impact on appropriateness of hospital treatment patterns, controls on severity, could be examined with particular focus on the use of ancillary services.

The overall study would then attempt to determine the gains achieved through PSRO review of various types in appropriateness of admissions, length of stay and services rendered, as well as identify areas of continuing deficiency upon which review could be focused. Further, identification of

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[1/] Gonnella, J. and Goran, M.J., "Quality of Patient Care - A Measurement of Change: The Staging Concept." Medical Care 13: 467-473, 1975.

relationships between severity stage and appropriateness of admission, coupled with validation of the staging methodology, could point the way to efficient computer-based profile analysis for focused review.

- Issue #5: Development of Measures of Appropriateness of Care

To the extent that inappropriate care is being provided to Federal beneficiaries, an effective utilization control program can reduce overall utilization. This raises two evaluation questions which could not be effectively addressed in this study: (1) How much inappropriate utilization is available to be reduced? (2) Is the program selective in reducing that portion of care which is inappropriate?

At present, health care research has not developed adequate methodologies to answer these questions, though regional variations in utilization rates, the experience of prepaid group practices, and studies of unnecessary surgery indicate that unnecessary care could well exist. One approach to the problem is the application of expert judgment to a sample of medical records with specific attention to the appropriateness of admissions, days of stay, and services. This might be applied before and after an intervention, such as PSRO review, and should utilize appropriate control groups.

Another approach could focus on correlates of existing variation in use rates. If lower utilization is not associated with lower population health status, can we not assume that less care could be rendered? Comparisons of outcomes of patients with the same diagnoses and different levels of intensity or duration of care, controlling for other relevant factors, may yield

evidence to validate methodologies for judging appropriateness. Similar controlled field trials are currently being undertaken.[1/]

- Issue #6: The Relationship Between the PSRO Program and Other Cost-Containment Activities

A contention frequently made in the study is that the PSRO program in and of itself, is not appropriately structured to be an effective cost-containment mechanism. It appears that the PSRO program must work closely with planning agencies, cost control commissions, etc., if its utilization control potential is to be fully realized. National health insurance schemes could also require the cooperation of PSROs.

A study might be conducted which would explore the initial linkages between PSROs and other components in the cost-containment arena. Field data from this present evaluation suggest that conflict may be as frequent as harmony.

[1/] See John Bunker, Benjamin Barnes, and Frederick Mosteller, Costs, Risks and Benefits of Surgery (New York: Oxford University Press, 1977).

GLOSSARIES

GLOSSARY OF ABBREVIATIONS AND ACRONYMS USED IN THIS VOLUME

AC	Admission Certification
AFDC	Aid to Families with Dependent Children
ALOS	Average Length of Stay
BC/BS	Blue Cross/Blue Shield
BHI	Bureau of Health Insurance (Social Security Administration)
BQA	Bureau of Quality Assurance
CAP	Colorado Admissions Program
CFMC	Colorado Foundation for Medical Care
CHAP	Certified Hospital Admissions Program (Sacramento)
CME	Continuing Medical Education
CONSERVE	Concurrent On-Site Evaluation and Review Effort (Multnomah)
CPHA	Commission on Professional and Hospital Activities
CR	Concurrent Review
CSR	Continued Stay Review
DDR	Division of Direct Reimbursement (Social Security Administration)
DHEW	Department of Health, Education, and Welfare
DO	Doctor of Osteopathy
DOC	Days of Care
ECF	Extended Care Facility
ELOS	Expected Length of Stay
EMCRO	Experimental Medical Care Review Organization
FMC	Foundation for Medical Care
HAPP	Hospital Admissions Precertification Program (New Mexico)
HASP	Hospital Admissions and Surveilance Program (Illinois)
HCFA	Health Care Financing Administration
HDS	Hospital Discharge Survey (Nat. Ctr. for Health Stat.)

OSCHUR	On-Site Concurrent Hospital Utilization Review (Utah)
PAS	Professional Activities Study
PDUR	Pre-Discharge Utilization Review (Pennsylvania)
PHDDS	PSRO Hospital Discharge Data Set
PHS	Public Health Service
PIP	Periodic Interim Payment
PIPSRO	Private Initiative in PSRO
PMIS	PSRO Management Information System
PSRO	Professional Standards Review Organization
PSRO-GLSC	PSRO-Genessee, Lapeer, and Shiawassee Counties
SNF	Skilled Nursing Facility
SRS	Social and Rehabilative Services
SSA	Social Security Administration
SSI	Supplemental Security Income
TAP	Technical Advisory Panel
UHDDS	Uniform Hospital Discharge Data Set
UPRO	Utah Professional Review Organization
UR	Utilization Review

H-ICDA	Hospital-International Classification of Diseases-Adapted
HMO	Health Maintenance Organization
HSA	Health Systems Agency
HS&QB	Health Standards and Quality Bureau
HUP	Hospital Utilization Project (Western Pennsylvania)
ICDA-8	International Classification of Diseases-Adapted (8th revision)
ICF	Intermediate Care Facility
IOM	Institute of Medicine (National Academy of Sciences)
JCAH	Joint Commission on the Accreditation of Hospitals
LOS	Length of Stay
LTC	Long Term Care
MAP	Medical Audit Program
MCE	Medical Care Evaluation (Studies)
MCH	Maternal and Child Health (Program)
MD	Doctor of Medicine
MOU	Memorandum of Understanding
NCHS	National Center for Health Statistics
NCHSR&D	National Center for Health Services Research and Development
NPSRC	National Professional Standards Review Council
OASH	Office of the Assistant Secretary for Health
OMB	Office of Management and the Budget
OPEL	Office of Planning, Evaluation and Legislation
OPSR	Office of Professional Standards Review

GLOSSARY OF TERMS

Admission Certification (AC) - One segment of the Concurrent Review component of the model PSRO review system in which federal patients' admissions are reviewed for medical necessity and the appropriateness of the level of care using diagnosis-specific admission criteria and standards plus the assignment of a certified length of stay using diagnosis-specific norms, criteria and standards.

Admission rate - The number of admissions to a health care facility or group of facilities as a factor of a unit of population or program enrollees, usually per 1000 enrollees.

Ancillary Services - Those health care services provided in a health care facility other than general nursing care, such as laboratory, radiology, physical therapy, respiratory therapy, etc.

Assessment and Monitoring - Those procedures performed by a fiscal intermediary or state agency to evaluate the review procedures of a PSRO or hospital and verify the results of a sample of the reviews.

Average Length of Stay (ALOS) - A measure of the number of days stay for the average patient; calculated by dividing the total days of care by the number of discharges.

Baseline data - Data representing the pre-treatment period(s) of a study.

Benefit-cost - The ratio of the dollar value of the results of a program or activity to the costs incurred in carrying out the program or activity.

Break-even - The state whereby the benefit or return from a program or activity equals the costs incurred.

Break-even point - The combination of inputs which bring about an equal return (output).

Case mix - The relative distribution of different diagnoses or diagnostic groups.

Case mix severity - A measure of the relative distribution of different diagnoses measured by the expected aggregate days of care (calculated from expected lengths of stay attributed to the diagnoses of actual cases).

Claims Review - The review of claims for reimbursement by a third party payor, generally for eligibility and coverage determinations, but sometimes including medical necessity.

Concurrent Review (CR) - One component of the model PSRO review system where institutionalization of federal patients is reviewed while the patient is in the faiclity. CR is composed of Admission Certification and Continued Stay Review (q.v.).

Conditional PSRO - An organization that has demonstrated its capability to perform the duties of fully designated PSRO, enlisted the membership of 25% of the physicians in the area, developed a review and implementation plan, and met other PSRO organizational requirements and has been awarded a contract to implement the required review and other functions.

Cost Effectiveness - The state whereby the benefit of a program or activity equals or exceeds the costs incurred; a benefit-cost ratio of 1 to 1 or greater.

Continued Stay Review (CSR) - One segment of the Concurrent Review component of the model PSRO review system in which federal patients whose admission has been certified by the Admission Certification process are periodically reviewed to assure the need for continued hospital care and that that care is being provided efficiently and economically using diagnosis specific norms, standards, and criteria.

Criteria - Predetermined elements against which aspects of the quality of a medical service may be compared developed by professionals relying on professional expertise and on the professional literature.

Days of Care (DOC) - A measure of utilization equal to the sum of the number of days stay for each inpatient; the product of the number of admissions and the average length of stay.

Delegation - The assignment of Concurrent Review and/or Medical Care Evaluation Study functions to a hospital committee of physicians that has demonstrated a capability and desire to perform those functions.

Discharge abstract - A formal summary of the pertinent information from the medical record of an episode of hospitalization.

Discharge abstract service - A data service in which participating provider institutions submit discharge abstracts which are then processed and reformated to provide various utilization profiles.

Federal patient - A patient whose care is paid for in whole or in part under the Social Security Act (Title V, XVIII, or XIX)

Fixed Costs - That portion of total costs which does not vary with changes in quantity.

Focused Review - Review that concentrates on a perceived problem area that may be a specific diagnosis, procedure, provider, or other limited scope topic, in lieu of comprehensive review.

Health Maintenance Organization (HMO) - A prepaid group practice plan.

Health Systems Agency (HSA) - A regionally-based planning organization established pursuant to P.L. 93-641 and charged to plan for the health needs of all residents of its health service area, promote the development of needed health resources, and reduce inefficiencies.

Length of Stay (LOS) - A measure of utilization equal to the number of days a patient is institutionalized; calculated by subtracting the admission date from the discharge date.

Medicaid State Agency - A state governmental agency that administers the State's Medicaid program and normally acts as an intermediary for the payment of Medicaid claims.

Medical Care Evaluation (MCE) Studies - One component of the model PSRO review system whereby a medical care topic area is selected and studied on sample basis, usually retrospectively, to assure the quality of care and effective administration of health care services. Generally, the process is one of choosing a topic, establishing criteria and standards, collecting and analyzing data to identify deficiencies, implementing corrective action and restudying the topic.

Medicare fiscal intermediary - An organization which has contracted with DHEW to process claims for reimbursement of medical care under Title XVIII of the Social Security and which actually pays such claims as an agent for the federal government.

Medicare Part A - Part of Title XVIII of the Social Security Act providing hospital insurance benefits to the aged and disabled covering hospitalization and related post-hospital services.

Medicare Part B - Part of Title XVIII of the Social Security Act providing voluntary supplemental medical insurance benefits to the aged and disabled covering physician and other professional services, outpatient services, home health services, etc.

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Medicare Part B - Part of Title XVIII of the Social Security Act providing voluntary supplemental medical insurance benefits to the aged and disabled covering physician and other professional services, outpatient services, home health services, etc.

Norms - Numerical or statistical measures of usual observed performance.

Patient day - A unit of utilization consisting of one day of stay for one patient.

Per Diem Charge - The average total charge for a day of care (one patient day), including both accommodations and ancillary charges.

Planning PSRO - An organization which has demonstrated the potential to meet the requirements for conditional PSRO designation and has been awarded a contract for financial assistance to develop that potential by developing a review plan and implementation plan, recruiting physician members, and collecting baseline data.

Pre-admission Certification - The performance of the Admission Certification process on elective cases prior to admission. Pre-admission certification may be performed by PSROs in lieu of Admission Certification with the approval of DHEW.

Profile Analysis - One component of the model PSRO review system whereby aggregate statistical data are used to identify areas where utilization practices may be inappropriate, to focus Concurrent Review and to assist in the selection of topics for Medical Care Evaluation studies. Additional purposes are to monitor the effectiveness of hospital review activities and display local, regional, and national norms of utilization.

Retrospective review - Review performed after the discharge of a patient.

Standards - Professionally developed expressions of the range of acceptable variation from a norm or criterion.

Targeted Review - Review of less than 100% patient stays. Usually diagnoses subject to abuse or focused on.

Title V - The Maternal and Child Health and Crippled Children's Services Program of the Social Security Act.

Title XVIII - The Medicare (Health Insurance for the Aged and Disabled) Program of the Social Security Act.

Title XIX - The Medicaid (Grants to States for Medical Assistance) Program of the Social Security Act.

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